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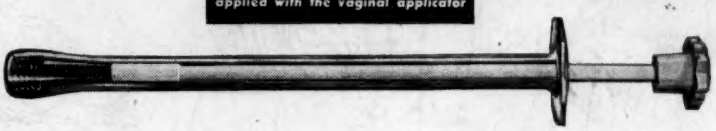

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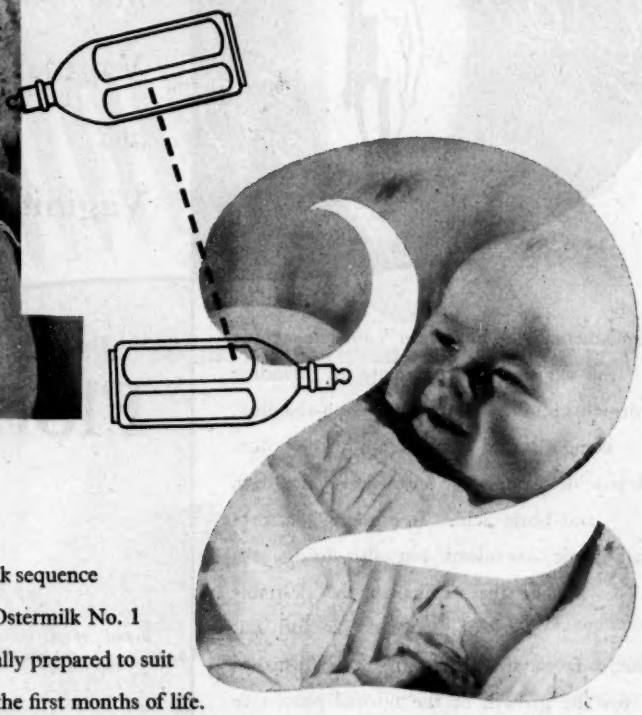

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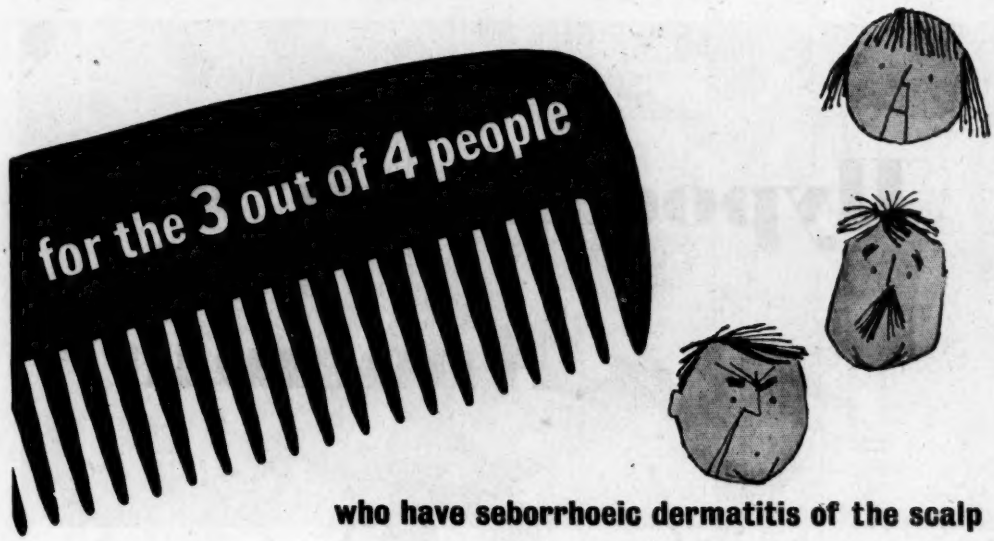

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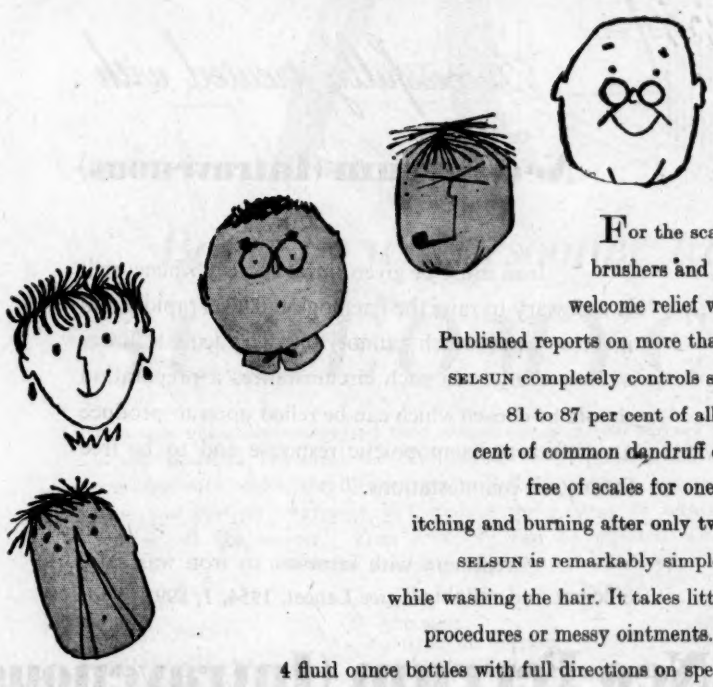

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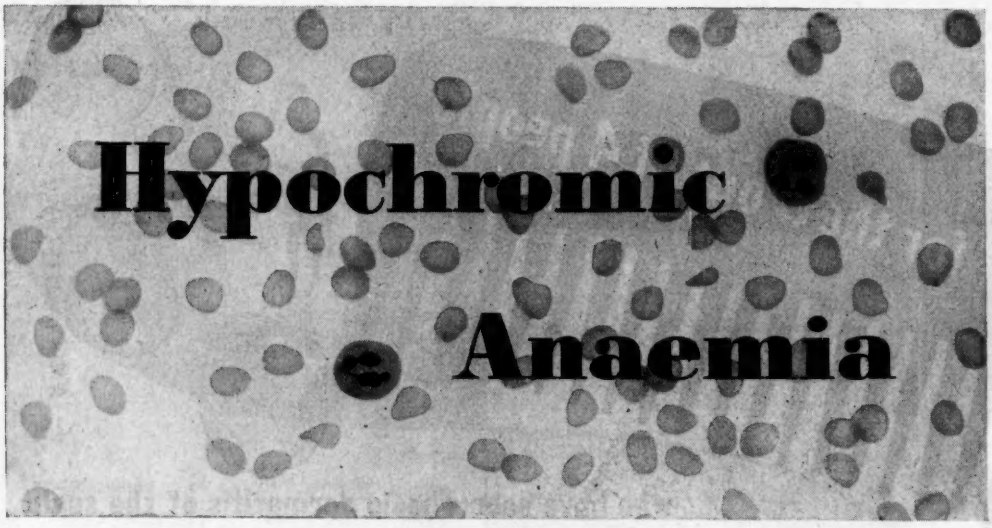

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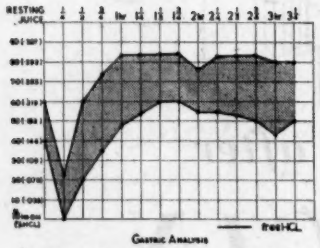
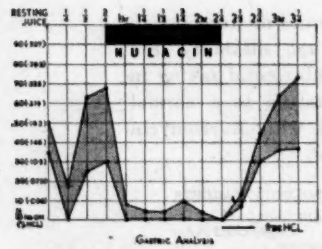


Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

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Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip.q.s.

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PRESERVATION AND TRANSPLANTATION OF HUMAN TISSUES *

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THE transplantation of tissues is the greatest unsolved problem of surgery. If the transplantation of organs from one person to another ever becomes a practical proposition, surgery will change overnight and expand as dramatically as it did after the discovery of antisepsis and anæsthesia.

A transplant is said to be *autogenous* when taken from, and returned to, the same individual; *homologous* when it is transferred to another individual of the same species; or *heterologous* when transferred to a member of another species. In general terms, an autogenous transplant always "takes" and lives if it is alive when transplanted, if it receives an adequate blood-supply, and if it does not become infected. Nearly all homologous and heterologous transplants, on the other hand, eventually die, despite all we have so far been able to do to promote their survival. In clinical practice the only exceptions to this rule have been (1) transplants between identical twins which behave as autotransplants; (2) occasional instances of survival of organs or tissues, when the reason for success has been obscure; and (3) corneal grafts, which may behave in a special way. In experimental surgery, however, increasing numbers of successful homologous transplants of tissues, particularly of endocrine glands, are being reported, and this may lead to further progress in the clinical field—although it must be admitted that the use of inbred strains of animals renders the interpretation of some of these results difficult. Fortunately the ultimate destruction of nearly all human homologous and heterologous transplants does not necessarily mean that they have no use in clinical practice: in fact homologous transplants of blood, blood-vessels, bone, cornea, and other tissues are very useful. This means that whereas tissues for autogenous transplantation should be stored in such a way that the cells will survive, this is not always necessary for homologous or heterologous transplants which are usually incapable of forming a permanent living union with the tissues of the recipient.

Various methods have been used in attempts to overcome the difficulties of homologous transplantation. These include: (1) growth of the donor cells in the recipient's serum; (2) the use of fœtal tissues (it has been stated that fœtal tissues before a certain age do not evoke an immune reaction, but in man the tissues of a 16-week fœtus appear to evoke the same reaction as adult tissues); (3) attempts to modify the donor cells by various chemical or physical means; and (4) attempts to render the recipient more receptive by means of cortisone, corticotrophin, anti-histamine drugs, nitrogen mustard, and irradiation. All have been ineffective or have only slightly increased the survival-time of the transplanted tissues.

The Tissue Bank

In the surgical unit at St. Mary's Hospital we bank blood-vessels, bone, skin, cartilage, cornea, and certain endocrine glands. Some are frozen in empty containers, some frozen in glycerol saline, some stored in a refrigerator, and some freeze-dried. This bank was started in 1950 and though most of our experience has been with blood-vessels we are accumulating knowledge about other tissues.

The first essential is to obtain material which is normal, sterile, and free from any transmissible disease. This means a young donor, recently dead, not suffering from a transmissible disease. The most meticulous aseptic technique must be practised when taking and banking the tissues. Attempts have been made to sterilise contaminated material chemically (Levin and Larkin 1909), by cathode and X-irradiation (Meeker and Gross 1951), or by ethylene oxide (Hufnagel et al. 1953). Of these methods, chemical sterilisation denatures the proteins, and ethylene oxide, a volatile disinfectant used in the preparation of bacteriological media, is explosive and may cause accidents. In our experience, careful asepsis is preferable to techniques employing antiseptics; but it must be admitted that sterilisation with ethylene oxide, which only partially denatures the proteins, makes the collection of tissues extremely simple.

Storage with Cell Survival

The pioneer of tissue banking was Carrel (1908). In the early years of this century he developed an experimental bank for storing various tissues, particularly blood-vessels. Many others have modified his technique, notably Mátthews (1945) who showed that human skin wrapped in tulle gras and wrung out in isotonic saline remained viable after 21 days at 0°–4°C in a refrigerator, and Gross, Bill, and Peirce (1949) who stored arteries at 0°–4°C in 10% homologous serum in a balanced salt solution to which was added a buffer, a pH indicator, streptomycin, and penicillin. This method of storage permits cell survival for 4–6 weeks and is useful for the preservation of tissues in a viable state over this limited period.

A better method which permits cell survival for long periods is storage at −79°C or less in glycerol saline (Polge, Smith, and Parkes 1949). Spermatozoa preserved in this way have remained motile and fertile for more than a year, and transplants of human cornea have given satisfactory results after as long as 9 months (Eastcott et al. 1954).

Storage without Cell Survival

Certain tissues such as blood-vessels and bone, when used as homologous transplants, may be as useful dead (but not denatured) as alive. In fact, there is evidence that a homologous arterial transplant is less likely to thrombose if it is dead when transferred to the recipient (Pate 1953). Storage without cell survival can be carried out in a variety of ways; some techniques denature the proteins, others do not. The best results are obtained in surgical practice with those methods which leave the proteins in their natural state.

Frozen storage (Eastcott and Hufnagel 1950) and freeze-drying (Marragoni and Cecchini 1951) both provide tissues satisfactory for use after an interval of several years; they are dead but not denatured. Chemical preservation (Levin and Larkin 1909) in formalin or alcohol denatures the proteins, and tissues stored in this way give results in experimental and clinical practice which are inferior to those obtained with frozen or freeze-dried material.

Summary

Tissues should be taken with a full aseptic technique. Storage with cell survival is best achieved in the frozen state in glycerol saline when prolonged survival of certain cells can be expected. Preservation in a nutrient medium in a refrigerator gives good results for periods up to 6 weeks. When cell survival is not necessary, prolonged storage is possible either in the frozen state or with freeze-drying; the latter method has the advantage that tissues can be kept at room-temperature and sent from hospital to hospital by post.

* The Seventh Simpson Smith memorial lecture of the West London Medical School, delivered on March 24, 1954.

Transplantation of Particular Tissues and Organs

SKIN

Skin "takes" and lives in the recipient if it is autogenous; if homologous it always dies, the only exception being when donor and recipient are identical twins. A great deal of experimental work has been done on this problem but only since the studies of Medawar and his colleagues (1944, 1953) has real progress been made. They have shown that homologous transplants of skin fail because the host acquires an active immunity, and more recently they have devised a method of preventing the development of this. If a fœtal mouse of one strain is inoculated in utero with a suspension of living cells from an adult mouse of another strain (A), then when it grows up the mouse will be partly or completely tolerant to skin transplanted from any mouse of strain A. They call this phenomenon actively acquired tolerance, it being the exact inverse of the actively acquired immunity by which a host destroys a homologous transplant.

This experimental advance, although still by no means applicable to skin-grafts in man, has cleared up much confusion. In the past many methods, including the administration of cortisone and corticotrophin, and total body irradiation, have been used to prolong the survival of homologous skin transplants; but the effect has been relatively insignificant, for the donor tissue has eventually died.

Autogenous skin can be banked and used as a true graft for as long as it remains viable. In man homologous skin provides an excellent dressing for a large raw area; it survives for 3–7 weeks and then disappears. It is of interest that homologous skin transplants survive nearly three times as long in man as they do in certain lower animals such as the rabbit. This may explain why successful homologous transplants of human skin have been so often claimed. Freeze-dried homologous skin, even if dead, provides a satisfactory dressing, but the results are better if it is preserved in a viable state. Skin can be kept viable in human plasma and a balanced salt solution in a refrigerator (Hyatt et al. 1952). Autogenous skin preserved in this way has taken permanently as a true graft after 84 days' storage, and homologous skin has proved satisfactory as a dressing after 185 days. But we prefer to bank skin in glycerol saline in the frozen state; the results are good in clinical practice and the graft may remain viable longer than when stored by other methods.

The clinical uses of stored autogenous skin are obvious, those of homologous skin debatable. When a patient has lost so much skin that he cannot supply enough of his own, then homologous skin can be used as a dressing. But such a transplant may produce adverse reactions in the recipient: for example, a rhesus-negative patient might be sensitised by a transplant of skin from a rhesus-positive donor. An important practical point is that the first transplant is the most satisfactory; subsequent transplants from the same donor are destroyed more quickly (Medawar and Gibson 1943).

BLOOD-VESSELS

Blood-vessel transplants may be either arterial or venous.

Veins

Autogenous vein-grafts have been used in patients for over 40 years; they survive transplantation and may be employed to restore either the arterial or venous flow. When a vein-graft is used to restore a defect in an artery the results are good where (as in the case of the major peripheral arteries) the vein will be supported by the muscles, but if the graft is unsupported (as in the case of the aorta and its larger branches lying within the pleural or peritoneal cavities) the risk of rupture is too great. In clinical practice, autogenous vein-grafts are very useful to replace damaged or diseased arteries such as the femoral or popliteal; a blood-vessel bank is not necessary and a vein of comparable size, such as the saphenous, can be sacrificed without harm to the patient. In Korea a number of blood-vessel wounds have been repaired successfully with autogenous vein grafts, and in these young men with normal arteries a living autogenous vein-graft is likely to give better long-term results than a homologous arterial transplant.

Arteries

For obvious reasons, autogenous arterial grafts are rarely possible. This is unfortunate, for they survive transplantation and months or years later they are macroscopically and microscopically indistinguishable from a normal artery. In clinical practice arterial transplants are usually homologous, although heterologous transplants have been used. We have clinical experience of homologous transplants of arteries preserved in the frozen state in empty tubes or in glycerol saline, or preserved by freeze-drying. Because homologous arterial transplants do not survive, cell survival during storage may be unnecessary and the most convenient method of storage that does not denature the proteins is preferable. Of the methods so far tried, freeze-drying has been the most convenient; but it has still to stand the test of time.

Fate of homologous arterial transplants.—Irrespective of whether the artery is alive or dead, fresh or preserved, all homologous arterial transplants merely act as inert tubes; they do not function as true grafts.

I used to believe that the views of Guthrie (1912) and many others on the fate of such transplants were correct. They taught that the transplant acted as an inert tube, which was kept open by the force of the blood-flow, and that over a period of weeks or months the tissues of the host grew in to replace the donor artery. Intima grew out from the ends of the host vessel to provide a new lining for the transplant, and fibrous tissue grew in to replace the media and adventitia. Eventually all that remained were the elastic fibres, and these extracellular structures persisted for years in an apparently unchanged state.

We now think that this does not happen in man. Recently we have had the opportunity of examining four human arterial transplants which were patent and intact 9, 9, 4, and 2 months after their insertion. Three of these were femoral and popliteal transplants 6, 17, and 12 cm. long, and one was an aortic transplant 11 cm. long. All were much longer than the usual experimental arterial transplants which have formed the basis of former studies including our own. These transplants show only a little replacement by the tissues of the host. After 9 months the intima has grown out 1–2 cm. from the ends of the host artery; in the gap between this true intima, the transplant is covered by fibrin, and the media and adventitia have died; but most of these layers have persisted as dead donor-tissue with only a little replacement by the fibrous tissue of the host. Lastly, the elastic laminæ remain. The only point of agreement between these findings and those reported by many others is the persistence of the elastic fibres. This means that a human arterial transplant more than 4 cm. long consists over its central portion of a layer of fibrin, two layers of dead and almost amorphous donor artery, the elastic laminæ, and a few capillary tufts and areas of fibrous tissue where the host tissues have grown in. The preservation of the elastic fibres is probably the main reason why homologous arterial transplants have proved successful in clinical practice.

Dempster (1951) has suggested that blood-vessels are not antigenic, or that if they are antigenic their specific antigens are not strong enough to evoke an immunity reaction capable of disintegrating the transplant. This

is probably the reason why the host fails to replace the dead tissues of a homologous arterial transplant.

During the past $3^1/_2$ years we have had experience of 59 homologous arterial transplants in patients. 45 (76%) of these left hospital with patent vessels. The follow-up of these patients is beginning to give information which will help in the selection of cases for this operation. With vessels of the size of the aorta or common iliac arteries the results appear good even if the reason for inserting the transplant was arteriosclerotic thrombosis or aneurysm. In my view this is largely because vessels of this size are easier to handle surgically and less likely to thrombose after the operation than smaller arteries such as the popliteal. In the case of arteries of the size of the femoral or popliteal, the early results have been governed by the reason for doing the operation; in patients with normal or nearly normal arteries the early results are good, but in those with arteriosclerotic thrombosis the immediate success-rate is less and the later follow-up discouraging. Though we may yet have to change our views, we feel that homologous arterial transplants are worth while in the case of the aorta or its large branches; but for vessels the size of the femoral artery or smaller, an autogenous vein-graft may well prove to give better eventual results, particularly in patients with normal or nearly normal blood-vessels.

THE HOLLOW VISCERA

The ideal method of reconstructing a hollow viscus is by a primary end-to-end anastomosis which heals by first intention. When this fails, healing by second intention is possible provided that the viscus is not free in a body cavity. Many suture lines on the ureters, bile-ducts, or cervical œsophagus heal partially by first intention and partially by second intention, the leak being expected and adequate drainage provided. Sometimes a gap exists which the surgeon cannot close by direct suture; he may then have to transplant tissues. A convenient tissue for closing many defects in hollow viscera is autogenous skin, and this works well in the case of the cervical œsophagus (Rob 1951), the urethra (Browne 1949), and the trachea (Gebauer 1949). It would be an advantage if a free graft of the appropriate hollow viscus, either autogenous or homologous, could be used. Unfortunately we have to date met with little success. Experiments in this field have been made by Bromley and myself (1953) using the trachea. We reached the conclusion that free tracheal transplants, both autogenous and homologous, do not provide a satisfactory method of reconstruction. Many become necrotic and separate. The survivors develop a stricture. Direct suture under considerable tension provides a satisfactory repair. In this connection it is of interest to report that a patient whose trachea was reconstructed with a tube of tantalum gauze covered with fascia lata is alive and well $5^1/_2$ years later, the fascia lata having been replaced by the growth of the tracheal epithelium from the deges of the defect.

In my opinion homologous transplants of epithelial-lined hollow viscera will always fail until the basic problems of homologous tissue transplantaton have been solved. Autogenous grafting of hollow viscera works well if the donor tissue receives an adequate flow of blood. Except for the ureter after a renal transplant, technical difficulties have, so far, prevented the successful transplantation of a segment of a hollow viscus dependent for its blood-supply on a vascular anastomosis.

THE KIDNEY

Probably each organ responds in a different way; but I shall take the kidney as an example of organ transplantation.

The storage of organs in a viable state for more than a few hours has so far proved to be impossible. Opportunities for autogenous transplantation of organs, although very limited, have been neglected; for example, a surgeon who removes an organ because of suspected carcinoma, only to find a localised benign lesion, should consider replacing it. Dempster (1953, 1954) has shown in the dog that the kidney autotransplanted into the neck, although microscopically normal, is unable to concentrate urine, but that it can do so if transplanted to the iliac vessels—a curious finding not yet explained. The function of the homotransplanted kidney, so long as it survives, is equal to that of an autotransplant to the neck. The evidence accumulated by Dempster (1953) and others indicates that, like other homologous transplants, the kidney is destroyed by an active immunity developed by the host. For some curious reason, however, this does not always occur in man or at any rate is delayed for several months.

Miller (1953) and Lawler et al. (1950) have reported the prolonged survival of human homologous renal transplants. Miller's patient, who suffered from chronic nephritis, survived $5^1/_2$ months after such a transplant; throughout this period the kidney's function, as measured by clearance-tests, was about 10% of normal; it excreted 1200–1500 ml. of urine daily and reduced the blood-urea to 33 mg. per 100 ml. When the patient died from pre-existant hypertension the kidney was still working. In Lawler's patient the kidney was still excreting urine after 5 months. These isolated and, admittedly, only partial successes are encouraging and justify further attempts in suitable cases.

ENDOCRINE GLANDS

Halsted (1909) found that autogenous parathyroid transplants were successful only if there was a considerable deficiency of parathormone. This observation that an endocrine transplant is more likley to be successful if there is a deficiency of the appropriate hormone holds good today. As with other tissues, autogenous transplants have a greater use in clinical practice than many think. A good example is the lingual thyroid: in most patients with this congenital abnormality there is no thyroid tissue in the normal situation in the neck. This state of affairs can be recognised and the ectopic thyroid can be transplanted to a better site. Boca and Marioni (1951) transplanted such a gland to the abdominal wall; two years later the patient's basal metabolic rate was +2 and 32% of a dose of radioactive iodine was taken up by the abdominal thyroid.

Cell survival is possible in certain endocrine glands stored in glycerol saline in the frozen state. Parkes and Smith (1951, 1953, 1954) have obtained an endocrinologically active transplant with rat ovary and testis stored in this way. This work is of twofold importance to clinical surgery: it makes homotransplantation easier, and it opens up a possible field for delayed autogenous transplants (Rob and Eastcott 1953).

Many successful homologous transplants of testis or ovary, either fresh or preserved, have been reported. In laboratory animals success has been confirmed by histological and other methods (Parkes and Smith 1953, 1954). In man, however, true successes have been very rare. Gaillard (1953) reports seven successful transplants of parathyroid tissue taken from human fœtuses and cultivated in the recipient's serum for 14 days before transplantation; but this and most of the other reports are open to the criticism that success was judged only on the clinical response. Woodruff (1953) states that four patients with Addison's disease treated by homologous transplantation of fresh adrenal tissue from fœtuses of 16–20 weeks all showed remarkable clinical improvement which was maintained for 9–12 months. Despite this, biopsies taken after 7–10 months revealed no trace whatever of the transplant.

It may be that different endocrine glands behave differently. In animals, certainly, it is easier to succeed with testicular or ovarian homologous transplants than

with the adrenal. But in my view a completely proven case of a permanently successful human homologous endocrine transplant has yet to be reported.

THE CORNEA

The cornea presents problems which some regard as unique. Without doubt a high proportion of homologous corneal transplants remain clear and function satisfactorily. And without doubt, to be successful a corneal transplant should be alive when placed in the host. Many authorities state that the cornea is the only example of a true homologous graft.

Explanations suggested for the success of homologous corneal transplants include:

(i) Corneal transplants, being avascular, cannot succumb to an immunity reaction even if they elicit one (Medawar 1948).

(ii) Corneal tissue placed correctly in front of the anterior chamber of the eye is incapable of evoking an immune reaction, because the tissue dosage is too low to be antigenic or the cornea possesses very weak antigens (Dempster 1951).

(iii) The cells of a corneal transplant do not survive and are gradually replaced by cells of the recipient (Maumenee 1953).

The first of these explanations appears the most reasonable, because it also explains the success of homologous transplantation of normal or neoplastic tissues into the anterior chamber of the eye (Woodruff 1952). It seems *that a corneal transplant is rapidly covered by an* outgrowth of epithelium from the recipient, and that *the main mass of transparent connective tissue stroma* remains in position for a long time. It may be replaced by the host's tissues but the process is slow.

The cornea is usually stored by refrigeration at a temperature of 0°–4°C but transplants cannot be kept *long. Eastcott and his colleagues (1954)* at St. Mary's Hospital have modified the glycerol-saline frozen-storage *technique so that partial-thickness grafts* can be kept for an almost indefinite period; but so far the results with full-thickness transplants, *although encouraging,* have not been as satisfactory. It may be possible after further study to devise a method for prolonged storage of all forms of cornea.

OTHER TISSUES

The commonest homologous transplant is a blood-transfusion. Other tissues—notably bone, cartilage, nerve, fascia lata, and tendon—have been used clinically. Bone is a satisfactory material; it can be permanently and conveniently preserved by freeze-drying storage; the transplant is gradually replaced by new bone formed by the host.

Conclusion

If one accepts the definition that a graft is a transplant of tissue which forms a permanent living union with the host, then one must conclude that—with the certain exception of identical twins and the possible exception of the cornea—a successful homologous graft has yet to be achieved.

Nevertheless useful results may be obtained with homologous transplants of arteries, bone, cartilage, cornea, the skin, and even the kidney. It is important to recognise that the response to homologous tissue transplantation varies both with the tissue or organ transplanted and with the species of animal.

Autogenous transplants can be made to take and survive permanently as true grafts. Certain aspects of autotransplantation in patients have been neglected.

Tissues may be stored in a variety of ways. Cell survival can be expected for a period of up to 8 weeks after storage at 0°–4°C in a nutrient medium. A better method is to store in glycerol saline at – 79°C or lower, when long survival is possible. When cell survival is unnecessary, storage may be in the frozen state or by freeze-drying; both allow almost permanent preservation but freeze-drying is the more convenient.

If our researches ever solve the problem of homologous tissue or organ transplantation then an immense expansion of surgery will occur.

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OXYGEN AND RETROLENTAL FIBROPLASIA

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THE relationship between the use of high oxygen concentrations in the treatment of premature babies and the development of retrolental fibroplasia has been widely discussed. The evidence has recently been analysed by Ingalls and Purshottam (1954), who accept the important part played by oxygen. The more recent report of a controlled clinical trial (Lanman et al. 1954) adds weight to their conclusions and leaves little room for doubt that exposure of a premature infant to high oxygen concentrations is at least a major factor in causing the disease.

TABLE I—COMBINED FOLLOW-UP RATES FOR ST. MARY'S AND DUCHESS OF YORK HOSPITALS FOR 1952–53

Total survivors up to age 6 months		284
Untraced		6
Followed up to 3 months		8
Followed up to 6 months: By other doctors or health visitors	50	270
By authors	220	
3 months follow-up (% of possible)		98
6 months follow-up (% of possible)		97

This paper records the disappearance of the disease from two premature nurseries in Manchester, and relates this change to restriction in the use of oxygen. The present findings were foreshadowed by Jefferson (1952). All the cases reported by her are recorded again in this paper, which now covers the period from Jan. 1, 1947, to Dec. 31, 1953.

The Main Investigation

The main survey has been made at the premature units of St. Mary's Hospital and the Duchess of York Hospital for Babies, Manchester. The two units are completely independent as far as medical and nursing staff are concerned. At St. Mary's, infants are admitted only from within the hospital itself: at the Duchess of York all the infants have either been born at home or in other hospitals. Jefferson reported on 629 infants. To these we now add a further 270.

Satisfactory information (partly retrospective) for the period Jan. 1, 1947, to Dec. 31, 1951, was obtained for 90% of the surviving infants. For the period Jan. 1, 1952, to Dec. 31, 1953, satisfactory information, up to the age of six months, was obtained for 97%. In some cases reports from general practitioners and health visitors have been the source of information. The details of the follow-up are analysed in table I. To exclude the possibility that some untraced children might have suffered from the disease, inquiries have been made both from the local authority and from the Royal

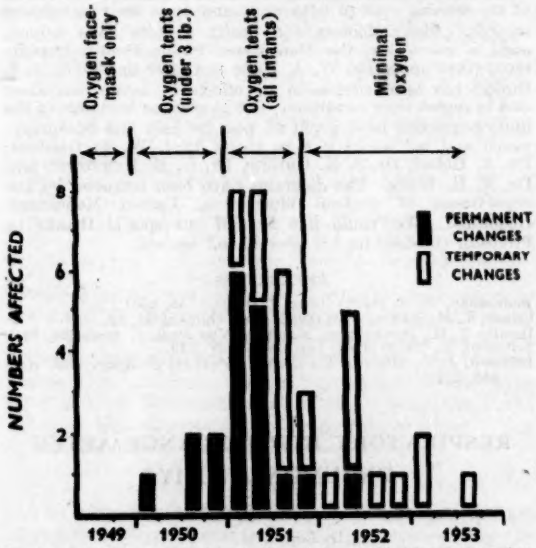

Fig. 1—Incidence of retrolental fibroplasia at St. Mary's Hospital from 1949 to 1953.

National Institute for the Blind. There have been no other known cases from the two units.

In the main survey the infants have been examined at least once a week while in the units and, thereafter, at intervals of two, three, or four weeks until the age of six months.

The methods of examination do not differ from those described by Jefferson, with the exception that a pair of 8 mm. lid retractors (Bedrossian 1952) are now available. These have been used only for the occasional difficult infant.

Diagnosis

The description "*temporary changes*" has been used only for eyes in which at least two of the following phenomena have been seen:

(*a*) Massive engorgement of the retinal veins.
(*b*) Tortuosity of the retinal arteries.

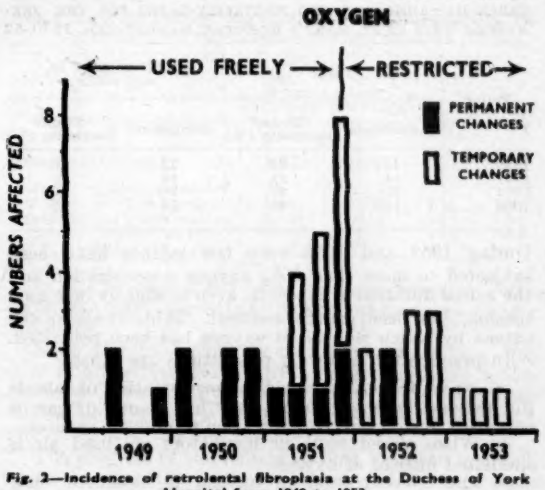

Fig. 2—Incidence of retrolental fibroplasia at the Duchess of York Hospital from 1949 to 1953.

(*c*) New vessel formation in the periphery of the retina.
(*d*) Retinal hæmorrhages.
(*e*) Early retinal detachment.

The term "*permanent changes*" has been used only where there have been detectable lesions after the age of six months (apart from myopia or retinal vascular tortuosity).

Incidence

The total number of cases now reported is 83: of these 36 have permanent changes. With regard to the diagnosis in some of the cases with temporary changes, it would be reasonable to accept that other observers might have reported different numbers. The figures for cases with permanent changes admit of no such challenge, for in each case there was definite disorganisation in at least one eye.

During 1947 and 1948 only 1 case was recorded. The main incidence of the disease occurred during 1950 and 1951 during which time there were 32 cases with permanent changes (20 of them were blind). During 1952 and 1953 there have been only 3 infants with permanent changes: none of these is blind. The last infant with any permanent change was born on June 8, 1952.

No temporary changes were reported before the first quarter of 1951. This was the time when routine examination of the fundus oculi was introduced in each unit.

Figs. 1 and 2 show the distribution of the 82 cases which were seen from 1949 to 1953. Before 1949 oxygen tents had been used only on rare occasions at St. Mary's Hospital. The unit at the Duchess of York Hospital was opened in 1949 and full oxygen facilities, including tents, were available at once. The intensive use of oxygen developed gradually as the policy of "naked nursing" was more fully adopted. This started in each unit in 1949, and the use of oxygen reached its peak during 1951 when, over a period of nine months, many infants were exposed to oxygen concentrations of 80%.

Oxygen Policy

The decision to use minimal oxygen was taken late in 1951 and this policy has been followed ever since.

TABLE II—AVERAGE DURATION OF EXPOSURE TO INCREASED OXYGEN CONCENTRATIONS (28-DAY SURVIVORS ONLY)

Period	St. Mary's Hospital	Duchess of York Hospital
1951 (1st quarter) ..	9·6 days	7·7 days
1952 (1st quarter) ..	6·9 days	3·9 days
1953 (1st quarter) ..	2·4 days	18 hours
1954 (1st quarter) ..	10·6 hours	23 hours

TABLE III—ADMISSION AND MORTALITY-RATES FOR THE PREMATURE UNIT AT ST. MARY'S HOSPITAL, MANCHESTER, 1950–53

Period	Total		Birth weight 3 lb. and under	
	Admissions	28-day mortality (%)	Admissions	28-day mortality (%)
1950 ..	153	29	13	56
1951 ..	117	31	19	70
1952 ..	139	29	20	72
1953 ..	110	25	18	72

During 1952 and 1953 very few infants have been subjected to more than 50% oxygen concentration and the actual duration of exposure, even to slightly increased tension, has been greatly reduced. Table II shows the extent by which the use of oxygen has been restricted.

In practice the following precautions are taken:

(*a*) Apart from the immediate resuscitation of infants (for periods no longer than a very few hours), oxygen is only used in sufficient concentration to prevent cyanosis.

(*b*) When closed tents or incubators are used air is circulated instead of oxygen.

(*c*) The concentration of oxygen is measured once each day with a pyrogallol apparatus ('Oxygenaire'). The time chosen for this is the moment before opening the tent after its longest period of closure.

(*d*) The flow of oxygen cannot be controlled with sufficient accuracy with either the "dial" type or the "bobbin" type of flow-meter, so an instrument called the 'Rotameter' is used. This measures down to a flow of 100 ml. per minute.

(*e*) Where prolonged exposure to oxygen is necessary the concentration is reduced very slowly, often taking several days to come down from 40% to atmospheric pressure.

Mortality-rate

It was at first feared that the decreased use of oxygen might increase the mortality-rate. It has been encouraging to find, in common with Crosse and Evans (1952) and Lanman et al. (1954), that such is not the case. Tables III and IV show the trends in both units. It will be seen that there has not been any significant change over the years. There has been a slight increase in the mortality-rate for the smallest infants at St. Mary's, but this is counterbalanced by an improvement at the Duchess of York. We do not believe that this increase is related to the diminished use of oxygen; in fact, at St. Mary's the highest survival-rate for the smaller infants was recorded in 1950 when the use of oxygen was far from its highest peak.

A Subsidiary Survey

An attempt has also been made to examine all the premature infants born in two large maternity units in Manchester (Withington and Crumpsall Hospitals) during the period Jan. 1, 1951, to June 30, 1953. In this survey it has been possible to examine each infant once only. This has usually been done before six months of age, but sufficiently late to be reasonably certain that no permanent changes would have occurred after the examination. In this survey also, reports from health visitors have been the source of information in a proportion of cases.

TABLE IV—ADMISSION AND MORTALITY-RATES FOR THE PREMATURE UNIT AT THE DUCHESS OF YORK HOSPITAL, MANCHESTER, 1950–53

Period	Total		Birth weight 3 lb. and under	
	Admissions	28-day mortality (%)	Admissions	28-day mortality (%)
1950 ..	93	26	20	45
1951 ..	74	36	21	71
1952 ..	78	29	20	60
1953 ..	88	28	17	53

450 infants were eligible for review and of these only 13 were not followed up: 3 of these had died and the remainder had left Manchester. Out of the whole group 82 had a birth weight of 4 lb. or less.

In both these maternity units the use of oxygen for premature infants has been restricted, first because not enough apparatus was available and later because the dangers were known. It is significant, however, that 12 of the cases (5 with permanent changes) reported in the *main* survey were born in Withington Hospital and were transferred to the Duchess of York Hospital within the first few hours of life.

Summary and Conclusions

During the past seven years 83 cases of retrolental fibroplasia have occurred in two premature units in Manchester: of these, 36 have permanent changes and 21 are blind. Since October, 1951, the amount of oxygen used for each infant has been severely restricted. Since November, 1951, there has been no case of blindness due to the disease. The incidence of incomplete and temporary changes has been similarly reduced.

These observations confirm the important rôle that oxygen plays in transforming a rare sporadic disease into a major cause of blindness. We are satisfied that the elimination of the disease by restriction in the use of oxygen can be achieved without detriment to the survival-rate.

We have depended greatly upon the unfailing coöperation of the nursing staff of both units and upon their meticulous records. Many doctors and health visitors have helped, and, in particular, the Manchester Public Health Department (first under Dr. W. A. Kane and later under Dr. A. I. Burke) has been tireless in its efforts to locate defaulters and to report their condition. The physicians in charge of the units concerned have given all possible help and encouragement, and we would like to thank Prof. W. F. Gaisford, Dr. A. Holzel, Dr. S. K. Guthrie, Dr. G. M. Komrower, and Dr. N. H. Wells. The diagrams have been prepared by the department of medical illustration, United Manchester Hospitals. We would like to add our special thanks to Professor Gaisford for his interest and advice.

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RESPIRATORY INSUFFICIENCY AFTER PNEUMONECTOMY*

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RESPIRATORY insufficiency is a dangerous sequel to pneumonectomy and occurs despite the most careful clinical selection of cases for operation. It is sometimes fatal soon after operation or may lead to severe breathlessness for the remainder of the patient's life.

The first object of the investigation reported here was to find the cause of respiratory insufficiency after pneumonectomy. Subsequently an examination was made of the value of laboratory tests of ventilatory function in assessing the likelihood of the occurrence of this postoperative complication.

Since many reports have been published that the contralateral lung overinflates after pneumonectomy, the proposition considered initially was that overinflation of

* Based on a paper read to the Thoracic Society, in London, on March 5, 1954.

the remaining lung caused dyspnœa after pneumonectomy.

Material

145 patients were examined before thoracotomy for bronchial carcinoma. Most of them proved inoperable, and some of the remainder underwent lobectomy. A few were missed in the postoperative follow-up, and some others died within six months of the operation. 15 men form the material of this report. Their ventilatory function was studied before operation and two weeks, three months, and six months after pneumonectomy. The left lung was removed in 7 cases, and the right lung in the 8 others.

Methods

All the tests were made by one observer, with the patient sitting comfortably on a chair. Vital capacity (V.C.) was measured in its component parts of inspiratory capacity (I.C.) and expiratory reserve volume (E.R.V.) on a closed-circuit spirometer of Knipping type. The functional residual capacity (F.R.C.) was estimated on the same spirometer circuit by McMichael's (1939) method with helium as the indicator gas. The total lung capacity (T.L.C.) and the residual volume (R.V.) were derived from the V.C. and F.R.C. results. The mixing efficiency (M.E.) was measured during the estimation of the F.R.C. by Briscoe's (1952) method, as modified by F. J. Prime (personal communication). The maximum breathing capacity (M.B.C.) was taken as the best of three consecutive attempts with a spirometer of the type described by Bernstein et al. (1952). Only the F.R.C. volume was corrected to body-temperature. The spirometer-circuit temperature was 16°–24°C.

TABLE I—MEAN RESULTS OF SERIAL TESTS ON 15 PATIENTS

—	Pre-operative	After pneumonectomy		
		Two weeks	Three months	Six months
T.L.C. (*c.cm.*):				
Mean	5208	3027	3297	3323
S.D.	88·3	497	479	532
R.V./T.L.C. (%):				
Mean	38·6	44·0	42·9	41·9
S.D.	10·2	8·76	11·09	9·32
M.B.C. (*litres per min.*):				
Mean	94·9	58·4	65·9	68·7
S.D.	32·3	20·6	24·5	26·3
M.E. (%):				
Mean	82·4	84·6	89·5	85·5
S.D.	21·4	25·6	21·8	24·6

Results

The mean results of the tests on all the patients are shown in table I. Two weeks after pneumonectomy the remaining lung had a total capacity of 57·4% of that of the two lungs before operation. In some patients, however, the total capacity of the remaining lung was considerably more than half the T.L.C. before pneumonectomy. In an effort to explain this, the average T.L.C. of 10 patients who showed fully aerated lungs on radiography before operation was compared with the average T.L.C. of 3 men with one lobe unaerated on radiography before pneumonectomy. The mean postoperative T.L.C. two weeks after operation was 55·1% of the mean preoperative T.L.C. in the former group of 10 patients but 69·6% in the latter group of 3 patients, the difference being significant ($0·01 > p > 0·001$). This difference did not indicate gross overinflation of the remaining lung in these 3 men but underestimation of the preoperative T.L.C. in these patients in whom a part of the diseased lung was unaerated.

The 3 patients with preoperative lobar collapse being excluded, there was no significant difference between the degree of overinflation of a remaining right lung and that of a remaining left lung, the total capacities being expressed as a percentage of the preoperative finding (table II).

TABLE II—COMPARISON OF DEGREE OF OVERINFLATION OF *REMAINING LUNG AFTER PNEUMONECTOMY*

—		Right lung remaining	Left lung remaining	t	p
No. of cases		4	6	D.F. = 8	..
Preoperative (c.cm.) ..		4947	5673	1·17	>0·1
As % of pre-operative value	*After operation:*				
	Two weeks ..	53·47	56·16	1·46	>0·1
	Three months	63·49	61·96	0·66	>0·1
	Six months ..	62·89	65·54	1·12	>0·1

Since the total capacity of the remaining lung was not estimated separately by bronchospirometry before operation, no estimation can be made of any overinflation of this lung which may have taken place between the operation and the first postoperative test.

The progress of the remaining lung has been followed, however, with the first postoperative study as a basis for comparison. During the first three months after operation the remaining lung increased its total capacity by a statistically significant amount (table III). This increase was divided proportionately equally between the V.C. and the R.V. Consequently, the R.V./T.L.C. ratio did not increase further after its abrupt increase immediately after pneumonectomy.

The increase in total capacity of the remaining lung between the third and the sixth postoperative months was small and not statistically significant. The R.V./T.L.C. ratio remained unchanged, and the M.B.C. and M.E. did not alter significantly during this time (table III).

Relationship of Dyspnœa to Overinflation of Remaining Lung.—Had overinflation caused any reduction of respiratory efficiency, it might have been expected that dyspnœa would have resulted and, conversely, that patients made dyspnœic by pneumonectomy would have more overinflation of the contralateral lung than was found in those not excessively breathless after the operation. 2 patients in the present series were extremely breathless after pneumonectomy but did not have any more overinflation of the single lung than was found in the other patients.

Cause of Respiratory Insufficiency after Pneumonectomy.—Overinflation of the contralateral lung did not appear to have caused respiratory insufficiency after pneumonectomy. The 2 patients who became extremely breathless after operation were distinguished from the others by the fact that they had chronic bronchitis in addition to a bronchial carcinoma. They had a raised R.V./T.L.C. ratio, a reduced M.E. (mean 38·5%), and a low M.B.C. before operation, and their immediate postoperative course was complicated by an exacerbation of their bronchitis. Another bronchitic patient, not included in this series, died from respiratory insufficiency within three months of pneumonectomy, having had intense bronchospasm with resulting dyspnœa since his operation.

Prediction of Respiratory Insufficiency by Function Tests.—The results of the M.B.C. alone predicted accurately when postoperative dyspnœa would not occur. This sequel to pneumonectomy was not observed in patients

TABLE III—COMPARISON OF MEANS OF RESULTS (VALUES OF p FROM t TEST)

—	Preoperative to two weeks after operation	From two weeks to three months after operation	From three to six months after operation
T.L.C. ..	..	0·01–0·001	0·1–0·05
R.V./T.L.C. ..	0·01–0·001	>0·1	>0·1
M.B.C. ..	..	0·05–0·02	0·1–0·05
M.E.	0·1	0·05–0·02	0·1–0·05

whose preoperative M.B.C. exceeded 50% of normal—i.e., 70 litres a minute or more with the spirometer used in this work—for patients of this age-group. This was true whether or not they had bronchitis and despite any complaint of dyspnœa. The M.B.C. alone did not, however, distinguish between the 2 men made breathless by pneumonectomy (preoperative M.B.C. 55 and 63 litres a minute) and 2 others with equally low results (55 and 54 litres a minute) who were not so affected by the operation. Estimation of the T.L.C. and of its component parts was of no value in this prediction of respiratory insufficiency. The M.E. appeared to have little inherent value but was complementary to the M.B.C. in patients whose M.B.C. was less than 50% of normal.

Discussion

The lung remaining after experimental pneumonectomy in animals, although enlarged and having greatly dilated alveoli, does not show microscopical evidence of emphysema (Behrend and Mann 1936, Bremer 1936). Investigations of the size and function of the contralateral lung after pneumonectomy in man have shown overinflation either on comparison of its capacity with a predicted value (Cournand et al. 1950, Wiklund 1951) or by prolonged serial observation (Gaensler and Strieder 1951). The conclusions drawn from the findings and the suggestions made as a result have varied. Cournand et al. (1947) found no reason for advising treatment designed to restrict or prevent the development of overdistension of the remaining lung in young patients. They found no evidence that overdistension was harmful and, in considering the possible means of correcting it, warned that pulmonary function was sometimes reduced further by thoracoplasty done to obliterate the pneumonectomy space. Wiklund (1951), however, advised reduction of the size of the pleural cavity after a right-sided but not after a left-sided pneumonectomy, because the R.V./T.L.C. ratio was greater after a right-sided than after a left-sided pneumonectomy. Gaensler and Strieder (1951) investigated 40 patients, predominantly young and suffering from tuberculosis. They found that after pneumonectomy "there was no preponderance of evidence" that overdistension of the remaining lung led to the development of emphysema in it. Despite this they assumed that overinflation of a lung was undesirable (as it may well have been in their tuberculous patients) and advocated the maintenance of a pneumothorax in the pneumonectomy space, followed by sponge plombage. There was in their cases, as in those reported here, no progressive loss of M.B.C. despite increasing or well-marked overinflation of the remaining lung. Attempts to correct the overinflation by thoracoplasty reduced the M.B.C.

The results of the cases reported here show that the contralateral lung increases in volume after pneumonectomy, but the overinflation does not progress after three months after the operation. Since there is no evidence of the development of emphysema and no suggestion that the overinflation causes a progressive loss of ventilatory function, there seems to be no need to consider the prevention or the correction of this overinflation.

Respiratory insufficiency which followed pneumonectomy in these cases was associated with a coincident chronic bronchitis which had in itself reduced the respiratory reserve so much that the loss of a lung precipitated gross insufficiency.

The results obtained in these 15 patients show that a clinical attempt to predict postoperative respiratory insufficiency may be made more exact by estimation of the M.B.C., which is of value for two reasons: (1) if the result is greater than 50% of normal, the patient will probably not be breathless after pneumonectomy; and (2) if the result is less than 50% of normal and the patient has a history of chronic bronchitis, the risk of severe postoperative dyspnœa must be considered.

Summary

15 patients were investigated before pneumonectomy.

The remaining lung increased in volume between two weeks and three months after operation. There was no further significant increase in volume in the second three months of observation.

Overinflation had no demonstrable adverse effect on ventilation.

There was no association between overinflation of the remaining lung and postoperative dyspnœa.

Postoperative respiratory insufficiency occurred in this series only in patients who had chronic bronchitis.

Criteria are given by which the risk of respiratory insufficiency after pneumonectomy can be assessed with increased accuracy.

I wish to thank Mr. T. Holmes Sellors, F.R.C.S., for his interest in this work and for allowing me to investigate his patients at the Middlesex, London Chest, and Harefield Hospitals; and Prof. A. Kekwick for his encouragement and advice.

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17-KETOSTEROID EXCRETION IN INDIAN MALES

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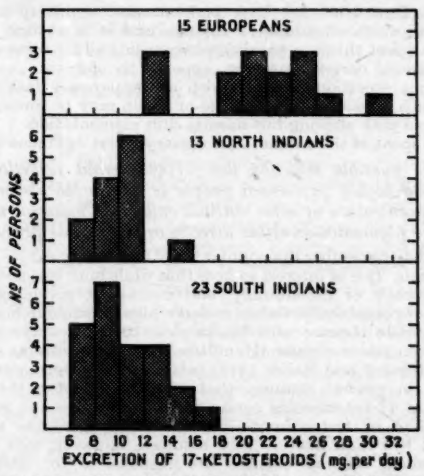
Barnicot and Wolffson (1952) reported that the mean 24-hour urinary 17-ketosteroid output in African Negroes (7·97 mg.) was lower than in Europeans living under the same conditions (13·71 mg.). The difference could not be correlated with any known environmental factors. The mean output of Africans living in London was found to be very similar to that of Africans in Nigeria. Sanjivi, Friedmann, and Thiruvengadam (1952) showed that the 17-ketosteroid excretion in South Indians with tropical eosinophilia was far below any values accepted as normal (2·7–10 mg.). So it was decided to estimate the 17-ketosteroid excretion in healthy S. Indians to see whether the normal average value was also lower than in Europeans and whether the values observed in tropical eosinophilia were below normal, and to obtain standards of reference for routine investigations.

Experiments

The donors were a random selection of apparently healthy Indian males, aged between 18 and 27 years and working in medical institutions in Madras, and Europeans of comparable age who had been living in the tropical conditions of Madras, Vellore, and Bombay.

A 24-hour specimen of urine (from the second urine of the first morning to the first urine of the second morning) was collected on to a few crystals of copper sulphate. The copper sulphate prevents not only the development of inconvenient amounts of ammonium carbonate (Medical Research Council 1951) but also diminishes the amount of pigment extracted by fat solvents or formed after acidification (Friedmann 1952). Most of the specimens were examined immediately after collection. The few samples sent by post were preserved with copper sulphate and hydrochloric acid. The neutral 17-ketosteroid output was estimated photometrically by the Zimmermann reaction (Medical Research Council 1951). The colour given by different concentrations of androsterone was used as a standard. The values reported are uncorrected


15 EUROPEANS
13 NORTH INDIANS
23 SOUTH INDIANS
No OF PERSONS
6 8 10 12 14 16 18 20 22 24 26 28 30 32
EXCRETION OF 17-KETOSTEROIDS (mg. per day)

Daily urinary excretion of 17-ketosteroids in South and North Indians and in Europeans.

—i.e., green filter only was used—so the actual 17-ketosteroid values are slightly lower than those given.

Results

The values in 23 normal S. Indians ranged between 7·05 mg. and 17·1 mg. per 24 hours. Of these only 3 excreted more than 14 mg. The mean value was 10·81 ± 2·32 mg., σ = 5·55 mg. In order to decide whether these low values in S. Indians pointed to a possible ethnic relationship with Africans, this investigation was extended to students from the North—Sindh, the Punjab, and Kashmir—who were living under the same conditions as the Southerners and who were the same age. The values in 13 N. Indians ranged between 7·9 and 14·04 mg. with a mean of 10·00 ± 1·02 mg., σ = 1·85 mg.

The histograms (see accompanying figure) for S. and N. Indians demonstrate a similar range of values, and statistical analysis indicates that there is no significant difference in 17-ketosteroid excretion between these two groups of Indian males. The values in the healthy Indians are above those in tropical eosinophilia patients (cf. Sanjivi et al. 1954; see Venning et. al. 1951 for low values in asthmatics).

The range in Europeans (15 subjects) was from 12·1 to 31·1 mg.; only 4 showed a value below 20 mg. Their mean was 21·28 ± 2·64 mg., σ = 5·10 mg. The 't' test was applied to compare the value for S. Indians and Europeans and for N. Indians and Europeans, and again the differences were remarkably significant. Incidentally, it may be noted that the difference appears to be more significant between N. Indians and Europeans than between S. Indians and Europeans.

Since the difference between S. and N. Indians was not found significant, the pooled Indian data were used to test for significant differences compared with the Europeans. The mean value for all Indians was 10·52 ± 1·53 mg., σ = 4·59 mg. Again, there was a highly significant difference between the 17-ketosteroid output of Indian and European males.

Possible Reasons for the Difference

The mean 17-ketosteroid output in S. and N. Indians is roughly half that in Western subjects, a comparable difference to that reported for Africans. The graphs of Zimmermann (1951) and Zimmermann et al. (1952) show that the mean daily excretion in Western males of this age-group is above 20 mg., while an excretion of roughly 10 mg. lies below or at the lowest limit of normal. From a survey of the literature, Mason and Engstrom (1950) concluded that the reported mean values lie between 12·5 and 16·7 mg. for normal Western men. The apparently high values observed in Europeans might be an effect of the tropical climate, which would make the low Indian values all the more remarkable. While this should be borne in mind, the possibly high mean is just as likely to be the result of the method of assay, for Barnicot and Wolffson (1952) found that climate did not seem to affect the 17-ketosteroid output in individuals leading a normal life, since Africans in London showed the same mean output as Africans in Nigeria.

FACTORS OF LITTLE APPARENT IMPORTANCE

Acclimatisation

It is, however, possible that there are racial differences in the acclimatisation process, and that adaptation to cold, as in Africans going to London, is different from adaptation to heat, as in Europeans going to India.

Barnicot and Wolffson (1952) do not give the results of the estimations on 4 European research-workers who were examined both in London and in Nigeria. Stein et al. (1949) found no significant change in 17-ketosteroid excretion in man after brief exposure to cold or heat, but Selye (1950) comments that the stress may not have been sufficiently severe. As a result of experiments with men in a simulated tropical environment (unfortunately 17-ketosteroid estimations are not included) Conn (1949) concludes that both the process of acclimatisation (complete in from 14 to 20 days) and the final condition of acclimatisation point to an increased level of activity of the pituitary-adrenal mechanism.

If the present results are due, at least in part, to a heightened pituitary-adrenal activity in the Europeans long acclimatised to the Indian heat, then we reach the striking conclusion that there is one "neutral" or "ideal" temperature-range for inhabitants of temperate zones and another for inhabitants of tropical zones. Conn's subjects were not studied for more than about two months, but it is very likely that a process of long-term acclimatisation supersedes the initial stress-like process that he observed. Otherwise, we must turn to the peculiar hypothesis of a continuous, if moderate, "alarm reaction" (Selye) in people from temperate zones who live for long periods in the tropics. It would, indeed, have to be maintained that under tropical conditions Europeans exhibit increased pituitary-adrenal activity which constitutes not a normal condition but a stress. In the present series no correlation could be established between length of residence in the tropics and 17-ketosteroid output.

Diet

It is known that 17-ketosteroid excretion is in some way related to diet. Starvation for four days lowers the 17-ketosteroid output by 31% (Miller et al. 1948) or 50% (Landau et al. 1948); but a low protein diet, only moderately restricted in calories, which might very roughly correspond to the diet of some of the Indian subjects, does not significantly alter the 17-ketosteroid excretion, in spite of a negative nitrogen balance as great as that in starved individuals. Kinsell et al. (1952) were able to diminish the 17-ketosteroid output in two patients receiving corticotrophin (A.C.T.H.) by giving a pure fat diet. Supplementing the fat diet of 1 patient with large amounts of proteins and subsequently with increasing amounts of carbohydrate produced a progressive rise in 17-ketosteroid excretion. The effect of supplementary carbohydrate without prior protein was not tested.

If the diet in healthy adults of any one age-group primarily determines the mean 17-ketosteroid output, then the experience of Landau et al., taken in conjunction with that of Kinsell et al., suggests a high rather than a low 17-ketosteroid excretion in Indians living on a low-fat high-carbohydrate diet. The question could perhaps be settled by comparing Indians and

Europeans living on similar diets, as would be the case in Europe and America.

Body-size

This is another possible variable, but it was not taken into account in the present investigation. There appears to be no relationship: workers in Albright's laboratory (Forbes et al. 1947) could find no correlation of height and weight to 17-ketosteroid output. Although the mean body-size of the Indian sample is lower than that of the Western sample, it does not compare with the lower mean 17-ketosteroid value.

SOME OTHER POSSIBILITIES

Since there is little reason for believing that environmental factors, such as diet or climate, are wholly responsible for the difference in mean excretion, it is necessary to look for other causes. There are four factors which may play a part: (i) race or ethnic affinities; (ii) basal metabolic rate (B.M.R.); (iii) pigmentation; and (iv) affective disposition.

Ethnic Affinities

If mean 17-ketosteroid output is racially determined, S. Indians would be expected to give lower values than N. Indians. Such a result would have provided some evidence of an ethnic affinity between S. Indians and Africans on the one hand and between N. Indians and Westerners on the other. As it is, the low values given both by S. and by N. Indians might indicate some common ethnic relationship to Africans. Evidence for such a relationship, with S. India at any rate, is provided by the occurrence of a sickle-cell trait in Negroes and in a number of S. Indian hill tribes (Lehmann and Cutbush 1952).

Basal Metabolic Rate

The B.M.R. is known to be lower in Indians than in Westerners. Niyogi et al. (1941), in an exhaustive investigation, excluded other known influences and concluded that the low B.M.R. in Indians may be a racial peculiarity. It is interesting to note that the average B.M.R. of the strongly built, wheat-eating population of the Punjab (N. India) has been reported to be low and similar to that of the inhabitants of other Indian provinces (Khanna and Manchanda 1946).

It is well known that a relation exists between the adrenal cortex and the B.M.R.: "corticoids, and especially cortical extracts rich in gluco-corticoids, restore the B.M.R. and low R.Q. [respiratory quotient] of adrenalectomised animals, but exert a rather inconstant influence upon the B.M.R. of intact animals" (Selye 1949). The few available data on the B.M.R. in Negroes, quoted by Wilson (1945), are inconclusive. The question of the influence of race on basal metabolism is still under debate (cf. Benedict 1937, Wilson 1945).* A relevant fact may be that when thyroid function is depressed 17-ketosteroid is low. While this relation holds in thyroid disease, it is difficult to say whether it applies to apparently normal individuals. There is clearly a connection via the pituitary. In any case, 17-ketosteroid output is stated to be low in hyperthyroidism also (Jailer 1952).

Pigmentation

The problem of pigmentation is one of the bugbears of biochemical, physiological, and clinical investigation. Much work has been done, but little is really known. A recent textbook states: "The amount of melanin in the skin in any degree has no known biochemical connection with the presence or absence of any other human characteristics" (Walker et al. 1952). One definite fact is, however, known—namely, hyperpigmentation occurs in most cases of Addison's disease.

Total adrenalectomy without adequate replacement increases pigmentation both in animals (Ralli and Graef 1943, 1945, Butcher 1945) and in humans (Kepler 1949); and administration of corticoids in Addison's disease sometimes decreases the pigmentation (Hurxthal and Musulin 1953, Tucker et al. 1952). It is true that hyperpigmentation is merely one of the symptoms of Addison's disease, and it is at first sight rash to select this as a parallel, disregarding all the other signs. The adrenal cortex, however, appears to elaborate various endocrine secretions, all of which are apparently lacking in Addison's disease, but only some of which may be diminished in people with striking but normal skin pigmentation. "One cannot speak of the adrenal as a unitary gland" (Pincus 1952).

It is possible that the low 17-ketosteroid excretion in normally highly pigmented people is due to the absence or low concentration of some cortical endocrine material which inhibits pigmentation either directly or through its precursor.

We may remember the popular belief that worry causes greying of hair. It is of interest to note that while both testosterone, given locally or parenterally, and œstrogens, given locally, orally, or parenterally, *induce* melanin pigmentation in humans and animals (Lerner and Fitzpatrick 1950), desoxycorticosterone in tissue-culture (Hamilton 1940) and cortisone in rat fur (Whitaker and Baker 1948) *inhibit* melanin formation.

It is in general assumed that in males about a third of the total 17-ketosteroids comes from the testes—i.e., it is a metabolite of testosterone—because females excrete about a third less than males. This assumes, however, that male and female adrenal cortices are responsible for identical excretions of 17-ketosteroids, and that testes and adrenal cortex in the male are bound in a more or less strict numerical relationship throughout life. Until this assumption is proved, it is difficult to say whether the low 17-ketosteroid output in highly pigmented people is partly or wholly due to a lower output of testosterone. Fractional analysis of 17-ketosteroids—e.g., by paper chromatography (Rubin et al. 1953)—and 17-ketosteroid estimation in Indian, as well as African, women may here prove helpful.

These arguments assume a *direct* or specific action of an adrenocortical hormone on melanin formation. The alternative of an *indirect* or non-specific effect of the adrenal cortex on melanogenesis is provided by the hypothesis of an increased pituitary activity in hypocortical conditions (Calkins 1950). The close association between A.C.T.H. and melanophore hormone is well known: there is evidence of increased A.C.T.H. concentration in the blood of patients with Addison's disease (Taylor et al. 1949); and, as Lerner and Fitzpatrick (1950) pointed out, patients with adrenal cortical insufficiency as secondary to hypopituitarism rarely have hyperpigmentation.

Apart from the question of a direct or indirect connection between the adrenal cortex and pigmentation, there are striking parallels between addisonian hyperpigmentation and racial pigmentation. Thus the racial differences are due to variations in the *quantity* of melanin present (Edwards and Duntley 1939). The same seems to be true when normal people and patients with Addison's disease are compared, for: (i) the deposition of pigment occurs on those parts of the body that are normally hyperpigmented (cf. Lerner and Fitzpatrick); (ii) in the Negro the changes produced by Addison's disease appear to constitute merely an intensification of melanin deposition along a racial pattern (Tucker et al. 1952). Conn and Mathews (1946) discuss the significance of the occurrence of patchy pigmentation of the buccal mucous membranes in normal and addisonian Negroes. A recent treatise (Hurxthal and Musulin 1953) actually enumerates various dark-skinned racial groups under the heading of differential diagnosis for Addison's disease. In this connection, it may be of interest to assay Latins, Levantines, and American Indians for 17-ketosteroid output. It is worth mentioning that normal female skin contains less melanin than comparable normal male skin (Edwards and Duntley 1939).

Marett (1936) speculates on the connection between pigmentation, dietary salt requirements, and hereditary differences in the adrenal cortex. It follows from the experiments of Spoor and Ralli (1944) on adrenalectomised rats that the metabolism of melanin is influenced both by the adrenal cortex and by sodium chloride—which are themselves interrelated.

One objection to the hypothesis of a relationship, direct or indirect, between adrenal cortical activity, *as manifested by 17-ketosteroid excretion*, and pigmentation is that pigmentation does not decrease at puberty, although 17-ketosteroid output rapidly and considerably increases. But the adrenal cortex is active throughout life, other steroids are added at puberty, and the

* I am indebted to Dr. E. D. Mason, of the Women's Christian College, Madras, for these references.

quantitative change may in part be due to changes in the metabolic transformation pattern of steroids at puberty. Venning and Kazmin (1946) found that urinary corticoids are absent from the urine of male infants 1–4 days old, but adult values are reached as early as $5^1/_2$ years.

Affective Disposition

Wooster (1943) made the interesting observation that prisoners convicted of violent crimes have a significantly higher 17-ketosteroid excretion than those convicted of non-violent crimes. The analogy of a possible difference in affective disposition between Europeans and Indians is clear. If this is, even in part, responsible for the lower 17-ketosteroid output in Indians, it is extremely hard to say whether it is due to inherited temperamental differences or to induced differences as a result of differing past experiences. In fact the approach to this problem of affective or temperamental differences from the point of view of two clear-cut, and apparently distinct, static alternatives is highly deceptive, since inheritance and environment are functionally and reciprocally intertwined. Some of these difficulties, with special reference to the adrenal cortex, are discussed in a Ciba Foundation colloquium (1952). While Wooster's results with prisoners under presumably similar environments are most readily interpreted in terms of inheritance or constitution as the dominant factor,† the emphasis on stress (Selye 1950) and on what Zimmermann et al. (1952) call meteorotropic influences, suggest an approach from the point of view of environment.

It is evident that a given stimulus may affect different temperaments quite differently, while conversely a person may owe his temperament to present or past circumstances: the one cannot be considered apart from the other. No temperament exists apart from its environment, and conversely the very idea of environment implies a relationship to persons living in it. The affective character undoubtedly has *some* connection with 17-ketosteroid excretion, but whether this connection should be searched for in the character *as such* —i.e., considered in isolation—is almost impossible to decide without rigidly controlled experiments, planned with the help of psychologists. In any case, a mere number, as of total 17-ketosteroid output, will never be able to say much about a person's affective disposition: fractional analysis of steroids will be necessary.

The Outstanding Problems

It is at present extremely difficult to correlate urinary 17-ketosteroid assays not only with factors such as these but even with adrenocortical activity itself. Although there is an evident relationship between 17-ketosteroid production and adrenocortical (or adrenocortical-testicular) activity, the precise nature of this relationship is not known (Landau et al. 1948, Tompsett and Oastler 1948), and thus it is difficult to relate 17-ketosteroid values to more definite physiological and biochemical data. Estimations of 17-ketosteroids happen to be widely followed because they are comparatively easily performed. The recently advocated estimation of urinary 17-ketogenic steroids as well as 17-ketosteroids (Norymberski et al. 1953) may here prove of fundamental value. We do not know whether the secretions of the various steroids are interrelated, quantitatively and qualitatively, and if so how. Venning and Kazmin (1946) found that the excretion of corticoids and 17-ketosteroids varied independently: this, of course, does not mean that some at least of the 17-ketosteroids are not derived from corticoids. Thus, 17-ketosteroid output is directly related to the circulation of that corticoid (compound F) which is thought to be the hormone secreted by the adrenal cortex after A.C.T.H. stimulation (Conn et al. 1951). It seems very probable that when care is taken to exclude variables such as disease, a comparison of mean excretions of 17-ketosteroids in groups with only one apparent dominant variable, as in the present study, will yield statistically valid information about adrenocortical activity. One objection to this, which cannot be met from our present knowledge, is that observed differences may be due merely to quantitative variations in enzymatic equipment—as, for instance, in liver, for the transformation of 17-ketosteroid precursors. The experiments of Barnicot and Wolffson (1952) showed no quantitative difference between Africans and Europeans in the contribution of injected testosterone to urinary 17-ketosteroids, but, as they point out, no comparative knowledge is available about the other 17-ketosteroid precursors.

The use of 17-ketosteroid estimations as an anthropological tool suffers from certain disadvantages, apart from the above difficulties of interpretation:

(i) Since the normal range of 17-ketosteroid output is wide among the different individuals of any one group and varies with age, it is essential to analyse the urine of a large number of subjects of the same age-group. Here different ages for puberty and different ages for senescence must be borne in mind.

(ii) Different methods yield different mean values. Hence comparisons between geographically separate groups may be difficult, apart from the influence of any of the other possible factors. This difficulty may be eliminated to a very large extent by following one standard technique.

(iii) 17-ketosteroid output does not provide an "either-or" characteristic, such as is given by a study of blood-groups, sickle-cell trait, or the occurrence of thalassæmia. Genetic correlations are unknown and almost certainly multiple.

(iv) A total 24-hour specimen of urine is essential. It is not always easy to obtain a sufficient number of healthy representatives of any one age-group, willing and capable of coöperating.

In any case, investigations of this type receive ever more attention from an anthropological and genetic point of view. A shift of emphasis from the purely descriptive or morphological to functional or principally biochemical investigations can be detected not only in zoology and botany, but also in their human counterpart, anthropology. "Comparative biochemistry," now a well-known but not a very old term (*Baldwin 1937*), links biochemistry to zoology, and in future presumably to botany. Perhaps we should now have a name for the similar link between biochemistry and anthropology. Besides physical and social anthropology, it will be necessary henceforth to speak of "chemical anthropology."

Summary

(1) The mean daily urinary neutral 17-ketosteroid excretion in healthy South and North Indian males is lower than in healthy European males. The difference is statistically significant for S. and N. Indians separately and for the whole group of Indians.

(2) No significant difference was detected in the mean 17-ketosteroid output of S. and N. Indians.

(3) The possible relation of these findings to climate, diet, body-size, ethnic affinities, basal metabolic rate, pigmentation, and affective differences is discussed.

Addendum

Definite evidence for a relationship between pigmentation and the adrenal cortex has been presented by J. Leschi (Pigmentation et fonctionnement cortico-surrénalien, Paris, 1953), who bases her conclusions on observations of differences in the serum sodium and potassium of white Frenchmen and Africans. These observations correlate pigmentation with the secretion

† The observations of Reiss et al. (1949), on spontaneous changes in the pattern of daily steroid excretion in mental patients, are relevant here; and at the Ciba Foundation colloquium (1952) emphasis was laid on relationships not merely to the adrenal cortex but to the total endocrine equilibrium.

of mineralocorticoids (deoxycortone). Since the various steroids are chemically similar, but exert opposite actions on melanin formation, depending on whether they are gonadal or strictly adrenocortical, it seems obvious that we are dealing with a finely balanced enzyme system on which the two groups of steroids act competitively. This would constitute an action of steroids in which they do not exhibit strict configurational specificity, unless the presence or absence of the ketol side chain at C_{17} is responsible. The rôle of the recently crystallised electrocortin may be of fundamental significance for pigmentation. Study of steroid-producing glands as a reflection of pigmentation might shed some light on the origin or evolution of the various branches of the human family. Some few data are available on the differences in size in endocrine glands in the members of different ethnic groups, although size gives no necessary indication of secretory activity. No such data appear to have been collected on Indians. In contrast to the work of Leschi on Africans, W. Radsma working in Indonesia (Festschrift Nocht, Hamburg, 1937; p. 464) found no significant difference between Europeans and Indonesians in serum sodium and potassium. Indeed, the Indonesians showed a very slightly *lower* serum potassium than the Europeans, while Leschi found much *higher* potassium values in Africans than in Europeans.

A connection between affective disposition, as conditioned by early experience, and the weight and response to stress of the adrenals has been demonstrated by some strikingly simple experiments of O. Weininger (*Science*, 1954, **119**, 285) on white rats. Mere gentle stroking for a daily short period (10 min.) during three weeks after weaning resulted in the following, in comparison to "non-gentled" controls: (*a*) significantly greater mean weight; (*b*) more activity and less fearful behaviour in an open field situation; and (*c*) less physiological damage to the endocrine, cardiovascular, and gastro-intestinal systems under prolonged emotional stress as adults. A given alarming situation gave results which were interpreted to show that the corticotrophin output in the animals which had long before been "gentled" was *less* than in the "non-gentled" animals. The relation of such observations to the present study is clear; taken together, their extension to the field of human education is formidable.

Pigmentation and affective disposition seem correlated, as far as is now known, with the activity of different regions of the adrenal cortex, since corticotrophin does not apparently affect the secretion of mineralocorticoids. The functional interrelation of the various zones of the adrenal cortex still constitutes an open problem.

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References continued at foot of next column

RECURRENT PERIPHERAL-NERVE PALSIES IN A FAMILY

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ISOLATED peripheral-nerve palsies are fairly common and can usually be attributed to gross trauma or to an associated disease. In some cases the cause remains obscure, and then "interstitial neuritis" is sometimes blamed, though with little pathological support.

In the family reported here peripheral-nerve palsies, some of which were recurrent, affected several of its members (see figure).

Case-reports

Case 1.—The father, aged 60, was examined on March 20, 1953, and said that at the age of 20 his right foot suddenly began to drag, and he could not dorsiflex it. There was no pain, but the outer side of the leg, from knee to ankle, felt numb. He had not been kneeling at the time, and he had not compressed or injured the leg in any way. The leg recovered within three months. When he was 25, exactly the same thing happened, the leg again recovering in three months. At the age of 55, while doing an odd job in an awkward corner, he rested his forehead on the edge of a table for several minutes. When he got up, the side of his head, from the forehead to the ear, was numb and remained so for about three weeks; the same thing happened in the same way on two later occasions. A year later, when he was 56, his right leg again became weak after he had been stooping for a short while; it gradually recovered. One day, when he was 58, he mowed the lawn for about an hour. Shortly afterwards, while pouring tea, his right wrist suddenly dropped, and the teapot he was holding spilled. The weakness of the wrist lasted two weeks. Eight weeks before attending hospital he awoke and found that his right leg had again become weak. The outer side of the

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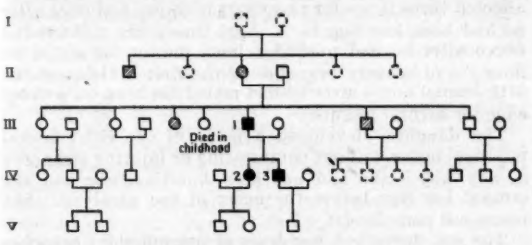

Family tree: peripheral-nerve palsies.

leg, from knee to ankle, felt numb, and he experienced "shivery" sensations in the numb area; when he touched it, "electric shocks" shot down the leg. The limb again gradually recovered, and at the time of the examination it felt quite normal again. In 1919 he fractured the base of his skull and severely injured his right eye. Thereafter he saw double on looking up and to the left.

Family History.—The patient, one of his two brothers, and two of his three sisters were questioned; their statements were contradictory. One of the sisters strongly denied that any other member of the family had been affected, but her evidence may have been biased, for she seemed to regard the affliction as something of a slur on the family name. The patient's father was not affected. The mother, according to the patient and one sister, had several attacks of weakness of the hands; this was denied by the other sister and the brother. An uncle, according to the first sister, had foot-drop on one side; the others knew nothing of this. The two sisters and the brother who were questioned never had a peripheral-nerve palsy. The third sister lives in America and cannot be traced, but the patient believed that she has had recurrent attacks of weakness of the hands; this was confirmed by the first sister. The second sister and the brother had no knowledge of this. The remaining brother, who also cannot be traced, is said by the patient to have had an attack of paralysis of one leg; this was neither confirmed nor denied by the others. Both the patient's children have been affected (cases 2 and 3). Four nephews, three nieces, two grand-nephews, two grandsons, and a grand-daughter have so far not had a peripheral-nerve palsy. Two nephews and two nieces cannot be traced.

On Examination.—Old injury to right temple and orbit. No obvious strabismus, but diplopia on looking up and to the left. Remaining cranial nerves normal. Slight weakness (4)* of the right extensor carpi radialis longus, extensor carpi ulnaris, and extensor digitorum. Other muscles and sensation in the upper limb normal. Slight weakness (4) of the right tibialis anterior, peronei, and extensor hallucis longus. Diminished sensation to light touch over the outer border of the right leg, from knee to ankle, with hyperæsthesia to pinprick, which was inaccurately localised. All tendon-reflexes brisk and equal. No other abnormal signs in any system. No bony abnormalities.

Investigations.—Hb 100%, red cells 5,300,000 per c.mm., white cells 9000 per c.mm., differential count normal. Serum-potassium level 15 mg. per 100 ml. Blood Wassermann reaction negative. No reducing substances, albumin, or porphyrins in the urine.

Case 2.—The daughter, a married woman, aged 31, was examined on March 13, 1953. A month before, she suddenly found that her right foot was dragging and she could not dorsiflex it. There was no pain or numbness. She had not been kneeling at the time and had not compressed or injured the leg in any way. Of other illnesses she had had only minor ailments.

On Examination.—Moderate weakness (3) of right tibialis anterior and extensor hallucis longus, slight weakness (4) of peronei. Diminished sensation to pinprick and light touch over a small area on the dorsal surfaces of the proximal phalanges and metatarsals of the right hallux and second toe. Both ankle-jerks absent; other tendon-reflexes brisk and equal. No other abnormal signs in any system. No bony abnormalities.

* The numerals in parentheses indicate muscle power according to the Standard Medical Research Council System.

Investigations.—Hb 90%, red cells 5,000,000 per c.mm., white cells 10,000 per c.mm., differential count normal. Serum-potassium level 16 mg. per 100 ml. Blood Wassermann reaction negative. No reducing substances, albumin, or porphyrins in the urine.

Progress.—Within two months the patient had recovered completely, and on examination no abnormality of the leg was detected.

Case 3.—The son, a married electrician aged 29, was examined on April 3, 1954. At the age of 18 he used an electric drill for about an hour, gripping the handle with his right hand. Afterwards his right little finger and the ulnar side of his right ring finger felt numb, and he found that these fingers were weak when he tried to grip anything. The remainder of the limb was unaffected, and he had neither paræsthesiæ nor pain. He recovered completely in two days. The following year, while he was on sentry duty, the same fingers suddenly became weak and numb again. He had not been using the right hand unduly, and he was holding his rifle in his left hand. Again he recovered completely in about two days. Two years later, after he had been kneeling for ten minutes, his left foot began to drag, and he could not dorsiflex it. He had no paræsthesiæ, pain, or numbness; and the leg recovered in about three days. When he was 23 the same thing happened after he had been kneeling for a short while. He had no paræsthesiæ, pain, or numbness; the leg recovered within three days. Since that time he has had several slight attacks, lasting a few hours, which have always come on after he has been kneeling. He has had no other illnesses except minor ailments.

On Examination.—No muscular weakness in the upper or lower limbs. No sensory loss. Reflexes brisk and equal. No bony abnormality. The patient declined further investigation.

Discussion

After studying 20 examples of palsy of the lateral popliteal nerve of seemingly unknown ætiology, Garland and Moorhouse (1952) conclude that such lesions probably always arise from compression of the nerve as it winds round the neck of the fibula. In 17 of their cases they were able to incriminate kneeling, bandaging, crossing the legs, wearing knee-pads, or lying on a hard surface as the cause of the compression. In the 3 other cases they could not find a definite cause. In 2 of these the paralysis came on while the patient was walking; in the 3rd the patient found his leg paralysed when he got up after sleeping on a soft mattress. One of their patients had recurrent attacks, four affecting the left lateral popliteal nerve, and the fifth affecting the right. There were no familial cases.

Recurrent peripheral-nerve palsies in several members of a family have been reported twice before. These cases were described as examples of familial recurrent peripheral neuritis, and there are important differences between them and the cases described here.

The first recorded cases appear to be in two sisters described by Ross and Bury (1893).

The younger sister was first affected when she was aged 25, weakness of the hands being associated with severe pain between the shoulders. She recovered completely after three weeks, but in the next nine years she had several attacks at intervals varying from a few weeks to three years. In the earlier attacks the forearms and hands were affected, some of the attacks coming on after she had used the hands for long periods. One of the attacks followed "some kind of a fit." When she was examined there was no sensory loss, though she complained of numbness of the fingers and burning in the hands and feet. In the last recorded attack the anterior muscles of the legs and the intrinsic muscles of the feet were affected, and there was sensory loss over the feet and the outer sides of the legs.

The elder sister was first affected when she was aged 43. After an attack of pain in the right hand most of the muscles of the right upper limb became weak, and two weeks later the other upper limb was affected in the same way. She also experienced severe pain across both shoulders. She had paræsthesiæ in the hands but no objective sensory loss. She gradually recovered, but had exactly similar attacks two years and three years later.

Wexberg (1935) may have had these cases in mind when he spoke of familial relapsing polyneuritis but he did not mention specific cases. If he knew of other cases, it is doubtful whether they had been published, for when Ungley (1933) described 3 familial cases of his own he could not find any previously published cases other than those described by Ross and Bury (1893).

Ungley (1933) described in a mother and two daughters recurrent attacks of polyneuritis which tended to appear or recur during pregnancy and the puerperium.

At the age of 26 the mother had two weeks' pain in the left forearm without loss of power. Thirteen years later, in the last three months of her fifth pregnancy, she experienced a similar severe pain in the left arm, and this was followed after the birth of twins, by left wrist-drop. This partly recovered in three years, but when examined twenty-one years after the attack she still had residual weakness of the extensors of the wrist and fingers but no sensory loss.

At the age of 20 the younger daughter had a few months' pain in the left shoulder and arm without loss of power. Two years later, three months before the birth of her first child, the pain returned to the left shoulder and gradually worked down to the hand; and the left arm became weak. Soon after the birth of the child she experienced pain in the right arm and suddenly lost the use of the limb. When examined she had wasting of both deltoids and of the thenar eminence and first interosseous space on both sides; and wasting and weakness of the left trapezius, supraspinatus, infraspinatus, biceps, and triceps muscles. There was sensory loss over the medial border of both forearms and over a triangular area on the dorsum of both hands. In the next six years she gradually improved.

At the age of 38 the elder daughter experienced severe pain over the spine of the right scapula and radiating down the radial side of the right forearm to the dorsum of the wrist and the middle three fingers. Within the next two weeks she developed right wrist-drop, after which the pain stopped. She had been using the right hand a great deal at that time. Five weeks later she experienced pain in the left shoulder and occasional shooting pains in the knees; and the legs felt weak. When examined she had weakness of the extensors of the right wrist and fingers, of the small muscles of the hand, and later of the brachioradialis muscle. Later still she developed slight sensory loss in the fourth and fifth fingers of the left hand, and diminution of the abdominal reflexes on the left side. She gradually improved, but twenty-eight months after the first attacks, two weeks after the birth of her first child, she experienced pain in the right shoulder and radiating down the right arm. Two days later the left shoulder and arm were similarly affected. Next the left leg became numb, both shoulders and arms became weak, and she developed left wrist-drop; at the same time she had severe pain in the left shoulder. There was diminished sensation in the left thumb. Four months later the pain had stopped, but the weakness and wasting in the upper limbs had increased. When examined the muscles involved were both deltoids, the clavicular fibres of the pectoralis on both sides, the right trapezius, supraspinatus, infraspinatus, latissimus dorsi, serratus anterior, and biceps; the left triceps and extensors of the wrist; and both thenar eminences and the left hypothenar eminence. The interossei were not affected. Later there was sensory loss over the left thenar eminence and over a small area over the left deltoid. Three years after the onset of the attack the patient had made almost a complete recovery.

These cases have been described in detail because, so far as we are aware, they are the only familial ones of this kind ever published. In 2 of them a single peripheral nerve in one or more limbs was affected. There the resemblance between these cases and ours ends, for in the 3 other patients several peripheral nerves in one limb were affected at the same time; and in all the cases the paralysis was preceded or accompanied by severe pain. Possibly the patients had neuralgic amyotrophy, a syndrome well described by Parsonage and Turner (1948). This condition usually affects only the upper limbs, but very rarely the legs may be involved (Elliott 1952).

In the family described here there appears to be an unusual tendency to peripheral nerve palsies. In the case of the father the right lateral popliteal nerve was affected three times for no apparent cause, and once after he had been kneeling for a short time; the right radial nerve after he had pushed a lawn mower for about an hour; and sensory branches of the first division of the fifth cranial nerve after he had rested his head on a sharp edge for several minutes.

The daughter developed a palsy of the right lateral popliteal nerve without compressing or injuring the nerve in any way; she had not been kneeling, nor had she crossed her legs before the onset of the paralysis. She recovered completely.

The son developed paralyses of (presumably) branches of the right ulnar and left lateral popliteal nerves. The palsies were transient but recurred. The paralyses of the left lateral popliteal nerve came on after kneeling. He then recovered completely. There was no history of injury or compression of the affected limbs.

In none of the patients examined is there evidence of bony abnormality, metabolic error, or specific disease. All appear well nourished.

We cannot find any previously published familial cases of this kind.

Summary

Three members of a family have had isolated peripheral-nerve palsies, some of the attacks being unexplained, whereas others followed minimal trauma.

The father and the son have had recurrent attacks, but so far the daughter has had only one attack.

Other relations may have been affected, but the evidence of this is uncertain and contradictory.

I am very grateful to Dr. Frank A. Elliott for permission to publish and for his great help in preparing this paper.

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ACUTE POTASSIUM INTOXICATION

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SENSORY symptoms have been reported by Arden (1934) and Keith et al. (1942) and tetany by Berker et al. (1951) in volunteers given large doses of potassium salts by mouth. Acute intoxication by an overdose of oral potassium is very uncommon; in the case described here tetany and vivid sensory symptoms were conspicuous.

Case-report

A healthy man, aged 38, whose potassium balance was being studied, had been on a low-potassium intake for three weeks (31·2 m.eq. ≡ 1·2 g. of potassium daily in an 800-calorie diet) and was now due for a period of potassium saturation. Having little liking for the flavour of potassium citrate he disregarded instructions and took the whole day's dose—20 g. (186 m.eq. ≡ 7·25 g. K) in aqueous solution—in a single draught on a fasting stomach at 9 A.M. From 9.10 to 9.30 A.M. he had a feeling of intense abdominal discomfort and distension, followed at 9.35 A.M. by copious watery diarrhœa. From 9.45 to 9.55 A.M. he had faintness and malaise, amounting almost to angor animi, accompanied by a curious parosmia which can only be described as a "metallic" smell (rather like the "taste" of an old penny); an odd feeling in all the teeth, as though they were unduly sensitive (tingling and awareness of their existence); uncontrollable nasal irritation and rhinorrhœa, with paroxysms of sneezing; tingling in the fingers; and undue tenderness of the nerves in the arms, first noticed when leaning the ulnar borders of the forearms on the table. Gentle stroking over the ulnar nerves produced tingling locally and peripherally.

Inflation of a sphygmomanometer cuff on the left arm produced ischæmic paræsthesiæ in the left hand within 30 seconds, and the painful carpal spasm of tetany (Trousseau's sign) within 1 minute. The man also had asthenia, and profound weakness of the arms and legs. This symptom-complex gradually abated, only to be repeated from 10.10 to 10.25 A.M., when further intense watery diarrhœa occurred. From 10.35 to 10.50 A.M. the same symptoms recurred, even more intensely than before, and at 10.55 A.M. painful cramps affected both quadriceps femoris muscles, together with tingling and paræsthesiæ in the hands and feet, and tenderness in the calves of both legs, until 11 A.M. when further watery diarrhœa occurred. From 11.15 A.M. to NOON all the symptoms, including the malaise, gradually subsided, the last to go being the cramps in the quadriceps muscles and calves, which persisted until 12.15 P.M. At half-hour intervals from 9·45 A.M. until 12.15 P.M. Trousseau's sign of latent tetany was elicited.

Subsequent Experiments

(1) Against medical advice the man repeated the experiment next morning by taking the same amount of potassium citrate on an empty stomach. The same train of events took place; the pattern they followed was precisely as described above, but the symptoms were less severe. The amounts of potassium retained were 65 m.eq. and 40 m.eq. on the first and second days respectively. Unfortunately blood-chemistry data are not available.

(2) The same large dose of potassium citrate given a year later after nine months on a normal diet produced no ill effects other than transitory upper abdominal discomfort followed for the next half-hour by borborygmi and slight diarrhœa.

(3) Twice the amount of citrate (taken as 34 g. of sodium citrate in aqueous solution) after twelve months' normal diet produced no symptoms other than polyuria and moderate diarrhœa accompanied by borborygmi and transitory abdominal discomfort.

Discussion

It is highly improbable that the citrate ion was responsible for the toxic effects in this case. I have not been able to find any published report of the oral dose of citrate toxic for man, but by extrapolation of results of experiments on rats, mice, and rabbits (Sergent and Poncet 1952, Solis-Cohen and Githens 1928), it appears to be not less than 90 g. of citrate for a man weighing 70 kg., which is seven times the amount ingested in the present case. Furthermore, potassium salts other than citrate have produced similar effects: chloride and bicarbonate (Arden 1934, Keith et al. 1942) and phosphate (Berker et al. 1951); and in the present case, the patient, a year later, took double the dose of citrate with impunity. Therefore the potassium ion was responsible for the symptoms, although the alkaline salt may possibly have been a contributory factor.

Berker et al. (1951) induced tetany with a potassium-phosphate mixture buffered to pH 7; the present case refutes the suspicion that the tetany they observed may have been an effect of excess of phosphorus (Danowski and Tarail 1953).

The failure in the present case to reproduce the phenomena when the same dose of potassium was given after nine months' normal diet is probably due to the fact that the effect on the blood-potassium level of a given dose of potassium depends on the previous intake of potassium (Truscoe and Zwemer 1953). Although there are no supporting blood-potassium levels in the present case, published reports afford ample evidence that the blood-potassium level rose (Keith et al. 1942, Keith and Osterberg 1946, 1947, Berker et al. 1951).

The latent tetany, undue tenderness of the calves, and vivid sensory phenomena cannot be explained by a lesion at the myoneural junction. Although these phenomena do not provide evidence about hyperpotassæmic paralysis, the present case appears to support the view that the lesion in that condition is a neuropathy (Arden 1934, Bull et al. 1953) rather than a disturbance at the neuromuscular junction (Fiddick and Oleesky 1953).

It is, however, much more probable that the site of action of potassium in excess is universal—on nerves, muscles, and myoneural junctions alike. An explanation is afforded for the toxic symptoms in the present case, and for most of the effects noted by other observers, by the rôle of potassium in the ionic theory of neuromuscular excitability, which has been lucidly recapitulated by Denny-Brown (1953).

It is postulated that the interior of an excitable membrane (of nerve, muscle, &c.) is electrically negative, in part because of an excess of potassium within it, but more so because of the transport of sodium ions outwards (the "sodium pump") against a gradient due to the tendency of sodium ions continually to move inwards.

The normal mechanism of production of an electrical excitation reaction in nerve is a transitory change of permeability of the membrane to sodium ions which allows their ingress; the sodium ions are subsequently "pumped" to the outer surface again to complete the excitation reaction. These movements of sodium ions are accompanied by a shift of K ions in the reverse direction.

The "accommodation" of nerve is the process by which a nerve resists the action of an exciting stimulus. If accommodation is good, the nerve is resistant; if poor, it is overexcitable. On the ionic theory accommodation is a process of stabilisation to progressively changing environmental conditions such as alteration in concentration of calcium, potassium, or hydrogen ions. Accommodation is impaired, inter alia, by a reduction in the calcium, or an increase in the potassium, ion concentration. Ionised calcium stabilises the Na-K balance of ionised excitable membranes.

The rôle of ionic balance or interdependence is clearly demonstrated by the K-Ca antagonism in cases reported by Harrison et al. (1943, 1947), Engel and Martin (1948), and Engel et al. (1949). Patients with hypocalcæmia due to chronic diarrhœa did not develop tetany, because they were also hypopotassæmic; tetany was induced in them by giving potassium, and was subsequently abolished either by lowering the serum-potassium level or by giving calcium without changing the serum-potassium level.

The actual mechanism of the potassium effect in tetany is probably to produce a sudden disturbance in the Na-K balance at the surface of the membrane, which is the equivalent of the normal mechanism of production of an electrical excitability reaction.

Accommodation is poorer in the ulnar and sensory nerves; hence they are more vulnerable than the motor nerves to changes in the ionic equilibrium.

In the present case accommodation may have been impaired by the low-potassium diet. The ingestion of a large amount of potassium on an empty stomach caused a sharp rise in the blood-potassium level. The rapid accession of potassium to the nerves upset the surface ionic equilibrium and produced a state of over-excitability first in the more vulnerable, and later in the other, nerves; this state was manifested by the vivid sensory phenomena, tetany, and other symptoms described above.

Although tetany and sensory phenomena are such prominent features of acute potassium intoxication they are not usually observed in chronic potassium poisoning (Finch et al. 1946, Keith and Burchell 1949, Nicholson and Spaeth 1949). The rapidity of increase in concentration of K at the excitable membrane may determine the site of the chief disturbance—nerve, muscle, or neuromuscular junction—but the emphasis of the clinical picture, whether sensory or motor, remains an inexplicable individual difference.

The potassium was taken in a single large dose on a fasting stomach. The aftermath should warn those

engaged in similar experiments that the potassium load must be distributed in small doses, with or after meals, throughout the day.

Summary

Tetany and other symptoms, including paræsthesiæ and cramps, occurred in a man who took 20 g. of potassium citrate in a single dose by mouth. He had been on a diet low in potassium for the three preceding weeks.

After a normal diet neither the same dose of potassium citrate nor double the dose of citrate as sodium produced toxic effects.

I am grateful to Dr. Paul Fourman, of the department of experimental medicine in the University of Cambridge, for advice.

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PHÆOCHROMOCYTOMA

A CASE WITH HYPOTENSION, PAROXYSMAL HYPERTENSION, AND URINARY RETENTION

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PAROXYSMAL hypertension due to a phæochromocytoma was first described by Labbé and Tinel (1922). Sustained hypertension may also be caused by this tumour, which was found in 1% of 1000 patients who had undergone sympathectomy for "essential hypertension" (Smithwick et al. 1950).

The case described here showed classical paroxysmal attacks of hypertension, but also two unusual features—hypotension between the paroxysms, and retention of urine. The diagnosis, which presented some difficulty, was aided by the pharmacological tests.

Pharmacological Tests for Phæochromocytoma

Evans et al. (1951) classifies such tests as "provocative" and "adrenolytic." Histamine, tetraethylammonium bromide ('Etamon'), and methacholine ('Mecholyl') are used in provocative tests to induce a paroxysm of hypertension. 'Dibenamine' and piperoxan (benzodioxane) are used in adrenolytic tests to lower the blood-pressure in sustained or paroxysmal hypertension. A third type of test was described by von Euler (1951) and Engel and von Euler (1950), who showed that adrenaline and other catechol derivatives were found in excess in the urine of a patient with phæochromocytoma.

It is now established that there is no single reliable pharmacological test for phæochromocytoma, because both false positive and false negative tests are not uncommon—i.e., the tests are positive in the absence of a phæochromocytoma, and negative in the presence of a phæochromocytoma respectively, as is shown in table I.

TABLE I—REVIEW OF PHARMACOLOGICAL TESTS FOR PHÆOCHROMOCYTOMA

Test	False positive	False negative	Present case
Provocative :			
Histamine diphosphate 0·025–0·05 mg. I.V. (Roth and Kvale 1945)	40% of his series (Evans et al. 1951)	60% of his series (Evans et al. 1951)	Positive
Methacholine 10–25 mg. S.C. or I.V. (Guarneri and Evans 1948)	None found	Shapiro et al. (1951) one case	Negative
Tetraethylammonium bromide 400 mg. I.V. (LaDue et al. 1948)	Evans et al. (1951)	Litman and State (1949)	Not done
Adrenolytic :			
Piperoxan 0·25 mg. per kg. of body-weight I.V. (Biskind et al. 1941)	Grimson (1950) one case	Mason (1951)	Positive
Dibenamine 5–7 mg. per kg. of body-weight in a saline drip I.V. (Spear and Griswold 1948)	37% of his series (Evans et al. 1951)	Common with noradrenaline-secreting tumours (Pitcairn and Youmans 1950)	Not done
Urine :			
24-hour estimation of catecholamines (Engel and von Euler 1950)	None found	None found	Positive

These tests are sometimes dangerous. Drill (1949) and Bierman (1950) record alarming hypertensive reactions with benzodioxane in cases of essential hypertension.

In the present case a hypertensive paroxysm was precipitated by intravenous histamine. The piperoxan test proved difficult to assess, but the paroxysm subsided more rapidly than usual if piperoxan was given at the height of an attack (fig. 1). Catecholamines were excreted in the urine in great excess.

Case-report

A man, aged 50, was quite well until three years before admission, when he first noted attacks of palpitation lasting two or three minutes. At first these attacks came on about once daily, but gradually they became more frequent and followed a typical course. At the beginning of an attack he had a "jabbing" pain in the left iliac fossa; but this pain disappeared when the "palpitations" started. Next he developed nausea, sometimes vomited, and at the same time felt his heart "bumping," accompanied by throbbing in the head. His vision became slightly blurred. Sweating was a variable feature, and he perspired during and after an attack if the weather was warm. Also during an attack he noted increased salivation.

About two years before admission he noticed that he was perspiring considerably, drinking excessively, and passing less urine. At times he would desire to micturate; but, as he increased his intra-abdominal pressure, an attack came on and he could not pass urine. He could, however, micturate if the palpitation did not start. As he was a bus-driver, and when at work had no time to wait for the attack to cease, he was often distressed by retention of urine.

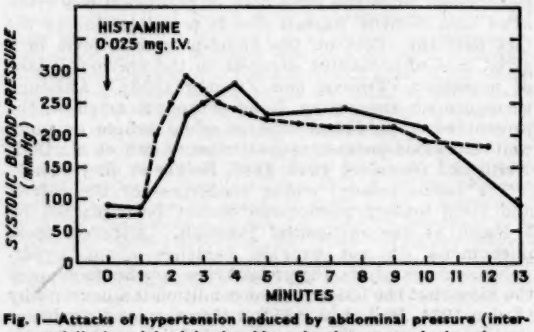

Fig. 1—Attacks of hypertension induced by abdominal pressure (interrupted line) and by injecting histamine intravenously (continuous line).

Eighteen months before admission the attacks had increased to four daily. He began to go pale during an attack, and his illness, which until then he had kept secret, became apparent to his wife. If he was seized by the palpitation when walking in the street he could not move, because his legs "went stiff." After the attack it was painful to walk, but gradually the pain subsided. If an attack came when he was sitting down, his arms ached and his fingers went white but did not feel dead. He felt as if he did not want to use his arms. About this time he discovered that lying on his left side would precipitate an attack. If he accidentally turned on to his left side during sleep, an attack would start and wake him up. He had gradually become constipated and took an increasing quantity of aperient. For a few weeks before admission he was even given enemas. His appetite was consistently good, but he had lost weight and become lethargic. For about a year before admission he had been impotent. For six months previous to this he had found that sexual intercourse precipitated an attack.

He gradually became weaker, and after twenty-five years' service he gave up bus-driving. He started next day as a night watchman. By this time he was having attacks every two or three hours. Exercise, such as filling a barrow with coal, would precipitate an attack, but after this he could work for two or three hours. He continued to work until, for the only time during his illness, he had pain lasting about half an hour in his chest and left arm during an attack. This started suddenly and was associated with the usual palpitations. He called in his doctor, who referred him to hospital. During the first few days after admission he had many more attacks than usual, but gradually they became less frequent. On systematic inquiry no other symptoms were elicited. There was nothing relevant in his past history or in his family history.

Investigations

On examination he was pale, with moderate dark pigmentation of his skin but no pigmentation in his mouth. His

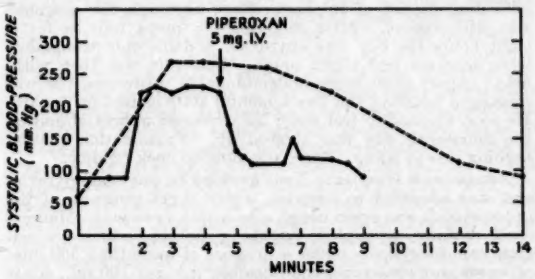

Fig. 2—Two histamine-induced attacks of hypertension, one of which was terminated by intravenous injection of piperoxan.

blood-pressure between paroxysms was 90/70 mm. Hg. There were no other abnormal physical findings and no evidence of neurofibromatosis.

The suspicion of paroxysmal hypertension due to a phæochromocytoma was confirmed by the intravenous injection of 0·025 mg. of histamine phosphate, which precipitated an attack with pallor, sweating, tachycardia, and salivation. The blood-pressure rose from 90/65 to 280/150 mm. Hg in two minutes (fig. 1) and fell gradually during five or six minutes to its former level. The fall was sharper when piperoxan was given intravenously at the height of an attack. The blood-sugar level did not alter appreciably during or after a paroxysm. Electrocardiography showed auricular extrasystoles but no tachycardia. The concentration of urine before operation was poor, the highest specific gravity being only 1·008. Intravenous pyelography showed poor renal excretion but no other abnormality. The blood-urea level was 65 mg. per 100 ml. A twenty-four-hour specimen of urine contained 730 μg. of noradrenaline (normal 20–40 μg. daily) and 82 μg. of adrenaline. A paroxysm of hypertension could be induced by pressure on the left iliac fossa or by the patient turning on to his left side. A tentative diagnosis of a left para-aortic ectopic phæochromocytoma was made.

Operation

At laparotomy a tumour was found in the right suprarenal gland. It was removed through a renal incision, without incident. The postoperative technique described by Pantridge and Burrows (1951) was followed. An intravenous noradrenaline infusion (containing 15 mg. of noradrenaline per litre of glucose-saline solution) was given, and the blood-pressure was kept at the previous resting level by adjusting the rate of flow. After forty-eight hours the drip was discontinued.

TABLE II—CORRELATION OF CLINICAL FEATURES

	Action of adrenaline	Action of noradrenaline	Effect of attack of paroxysmal hypertension in present case
Pulse-rate	Increase	Decrease	No effect
Systolic blood-pressure	Rise	Rise	Rise
Diastolic blood-pressure	Slight rise or no effect	Rise	Rise
Blood-sugar level	Rise	No effect	No effect

Modified from Goldenberg et al. (1950).

Pathology

The tumour consisted of a small nodule 1·7 × 1·5 × 1·0 cm. and a large nodule 3·0 × 3·5 × 2·5 cm. and was connected to a piece of normal suprarenal gland by tumour tissue 6·0 cm. long. The mass was brown and vascular, with many dilated blood-sinuses. The whole specimen weighed 35·6 g. and contained 64 mg. of adrenaline and 2080 mg. of noradrenaline per g. This ratio of adrenaline to noradrenaline was about the same as in the urine. The histological appearances of the tumour were typical of a phæochromocytoma: the cells, arranged in sheets, were polygonal, with either small dark or large pale nuclei.

Postoperative Progress

The immediate postoperative period was uneventful, and a repeat intravenous histamine test showed no rise in blood-pressure. A twenty-four-hour specimen of urine contained a normal amount of noradrenaline and adrenaline. The patient had no further paroxysms, and the urinary symptoms gradually regressed. Repeat urinary concentration tests showed normal renal function, the highest specific gravity being 1·020.

This excellent result was marred only by the development of symptoms suggesting duodenal ulcer from four to six weeks after the operation. A barium meal showed a constant deformity of the duodenal cap suggesting a chronic duodenal ulcer. A good response to medical treatment was achieved, and six months after the operation the patient was symptom-free and back at work as a bus-conductor.

Correlation of Clinical Features with Catecholamine Content of Tumour

The ratio of noradrenaline to adrenaline in the tumour was 20 : 1, and the features of an attack of paroxysmal hypertension in the present case therefore corresponded more closely to the action of noradrenaline than to that of adrenaline (table II).

Discussion

The symptoms caused by phæochromocytoma were analysed by Graham (1951), who reviewed 207 published cases and found that the most common symptoms were headache, palpitations, sweating, dyspnœa, weakness, pallor, dizziness, and substernal and abdominal pain. Paroxysmal symptoms were present in 140 cases and absent in 21; the remaining 46 cases were described too inadequately for classification.

Retention of urine has rarely been described as a symptom caused by phæochromocytoma, although in the present case it was a striking feature: indeed at one stage the patient was referred to a genito-urinary surgeon for prostatectomy. Barnett et al. (1950) record this symptom in one of their cases.

Stimulation of the presacral (sympathetic) nerve in man causes contraction of the internal vesical sphincter and possibly relaxation of the bladder muscles (Learmonth 1931). A sudden liberation of noradrenaline from a phæochromocytoma could produce this effect, and a continually high level of circulating noradrenaline might lead to retention with overflow. In the present case the rise in intra-abdominal pressure necessary to initiate the act of micturition was sufficient to start a paroxysm; the patient was then unable to empty his bladder, and a state

of chronic retention of urine resulted. The hypotension between the attacks can be explained only by assuming that the liberation of pressor substances was intermittent. The work of both Blacket et al. (1950) and Green et al. (1948) suggests that the intermittent liberation of pressor substances might lead to hypotension. Blacket et al. (1950) showed that continued infusion of a mixture of *l*-adrenaline and *l*-noradrenaline (1 part of *l*-adrenaline to 5 parts of *l*-noradrenaline) into a rabbit led to hypotension when, after five days, saline solution was substituted for the mixture. Green et al. (1948) showed that in man a long infusion of adrenaline was followed by a period of hypotension.

The impotence in the present case cannot be explained on a physiological basis and might be of psychological origin and due to the fact that intercourse precipitated an attack of hypertension.

The changes in renal function are also difficult to explain. Although adrenaline reduces the total renal blood-flow, the volume of glomerular filtrate is unchanged because there is an increase in the "filtration fraction" (ratio of glomerular filtrate to plasma flow). This increase may be due to a rise in glomerular capillary pressure from venoconstriction (Homer Smith 1951). The impaired concentration of urine is attributable to a defect in tubular resorption associated with impaired blood-supply. In many of the reported cases of phæochromocytoma renal function was normal.

The diagnosis of phæochromocytoma, though often easy in retrospect, may be initially difficult. In the present case, because of many unusual symptoms, chronic nephritis, Addison's disease, and carcinoma of the prostate were at first considered in the differential diagnosis.

Summary

A patient with a phæochromocytoma of the right suprarenal gland presented diagnostic difficulty because of two unusual features—hypotension and urinary retention.

The diagnosis was established by the production of a classical paroxysmal attack of hypertension by the intravenous injection of histamine.

The clinical features of the present case are discussed and the pharmacological tests for phæochromocytoma briefly reviewed.

We wish to thank Dr. H. P. Brody and Mr. W. J. Lytle for permission to publish and for their helpful advice; Dr. R. Wood for the catecholamine estimations; and Mr. A. R. Foster for the diagrams.

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FATAL ACUTE FRONTAL-LOBE ABSCESS
PRESENTING AS PYREXIA OF UNKNOWN ORIGIN

G. W. C. JOHNSON
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GENERAL PRACTITIONER

ABSCESSES of the frontal lobe may be difficult to diagnose. The one reported here shows how obscure they may be, and how urgent it is to discover them.

Case-report

A boy, aged 14, complained of headache, which lasted only a few hours. Two days later he felt feverish but denied any other symptoms. Examination revealed no abnormal physical signs except an oral temperature of 103°F and a trace of albuminuria. For six days his temperature stayed above 100°F, usually being highest in the mornings. He had drenching sweats. Repeated examination revealed no cause. On the fifth day of his illness his left upper eyelid was slightly puffy and red. Sulphadimidine had been prescribed for a suspected urinary infection, and perhaps because of this the eyelid was normal next day; the significance of the finding was not appreciated. Meanwhile investigation of the urine proved negative. On the sixth day of his illness he vomited, and after this his neck was slightly stiff towards the limit of flexion. His optic fundi were normal.

Blood examination showed red cells 4,050,000, Hb 12·5 g. per 100 ml., erythrocyte-sedimentation rate (E.S.R.) 33 mm. in 1 hr. (Westergren), and white cells 8200 (neutrophils 71%, lymphocytes 27%). A blood-culture proved negative.

Treatment and Course.—On the ninth day of his illness his temperature fell below 100°F. Recovery seemed in progress, and it was decided to attempt to expedite this by giving penicillin instead of sulphadimidine, although the diagnosis was still obscure. After receiving 0·8 mega unit in forty-eight hours the boy was apyrexial, and his only complaints were anorexia and slight cough. Penicillin was then withheld. Apart from some understandable depression (he was missing a holiday) the boy's mental state caused no remark. He soon claimed to feel well; he remained apyrexial and on the fourteenth day was allowed up. Examination showed nothing except pallor. There was now no neck rigidity.

Admission to Hospital.—Next morning he was again pyrexial and was admitted to hospital, where slight puffiness of the upper eyelids was again noted, also mouth breathing. Minimal neck stiffness prompted lumbar puncture, which yielded clear colourless C.S.F. under a pressure of more than 300 mm. of water and containing chlorides 660 mg. per 100 ml., sugar 114 mg. per 100 ml., protein 93 mg. per 100 ml. (normal values 720–750, 40–80, and 20–40 mg. per 100 ml. respectively), and 80 white cells per c.mm. (polymorphs 55%, lymphocytes 45%), but no micro-organisms. The blood showed slightly increased anæmia, much raised E.S.R. (80 mm. in 1 hr.) and white cells 24,000 per c.mm. (neutrophils 93%).

Course.—The boy's condition now rapidly deteriorated. He became confused and lethargic, lying on his right side with his legs drawn up, photophobic, and resenting interference. He could not complete simple sentences. As drowsiness increased, he vomited twice and lapsed into coma with dilated pupils and neck rigidity. A second lumbar puncture showed only 42 mg. of protein per 100 ml., but 225 white cells per c.mm. (polymorphs 90%). Several hours later the boy made convulsive movements with his right arm, became cyanosed, and died on the seventeenth day of illness. Streptomycin had been given after admission, but his temperature remained raised though fluctuating. His pulse-rate had been about 100 but fell sharply to below 60 a few hours before death. The respiratory rate rose latterly from 22 to 28.

Necropsy (20 hours after death).—A large diffuse abscess in the anterior two-thirds of the left cerebral hemisphere was found. There was creamy pus directly under the dura mater, and a small area of eroded bone on the inner table of the skull. Both frontal sinuses were full of pus, but their mucous lining was not hypertrophic. There was no overt infection of the other sinuses or of either middle ear. There was no evidence of compression of the ventricular system, and only a very slight medullary pressure cone. The spleen was "septic" and the adrenal glands large. No other abnormality was revealed. The pus showed numerous organisms on direct

smear. These were with difficulty cultured, and proved to be micro-aerophilic streptococci sensitive to the usual antibiotics.

Comment

Turner and Reynolds (1931) have shown that it is not easy to determine the incidence of intracranial complications of frontal sinusitis. Certainly they are not unduly rare, and are much more commonly found in acute infections than in chronic ones. Evans (1931) collected 194 cases of cerebral abscess from 14,534 necropsies at the London Hospital in 1908–25, of which frontal-sinus infection caused 8.

Sulphonamides and antibiotics have no doubt reduced the danger, but two points call for mention. This case illustrates that a sinusitis may be completely overlooked by several examiners; the infection may have already extended before effective treatment is begun. Further, there is the paradoxical hazard, exemplified in the present case, of masking symptoms by chemotherapy until the situation is irretrievable. Howells (1954) gives another instance of this, and states that lethargy may be the only demonstrable sign of a frontal-lobe abscess. Even this was not apparent in the present case. Tests of memory were not applied. Papillœdema was absent throughout, and bradycardia was terminal only, as was the speech defect.

I owe thanks to Dr. L. A. Little and Dr. P. C. McCrea for the pathological reports, and to Dr. J. V. Wilson and Dr. C. W. Curtis Bain for helpful criticism and permission to publish.

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New Inventions

A PLASTIC PEDOGRAPH

THIS apparatus has been devised to provide records of the vertical forces beneath each part of the foot during walking. It consists of 640 vertical rods of transparent 'Perspex,' each 6 in. long and $^3/_8$ in. square in cross-section. These are packed within a perspex jacket to form a block 15 in. long, 6 in. high, and 6 in. wide. Beneath the rods is a thick slab of firm 'Sorbo' sponge rubber. Each rod is scored with a horizontal line as shown in fig. 1; the essential feature is that the line on every member of one row is $^3/_8$ in. higher than that on the next row. The block is inset within a wooden platform 9 ft. long and illuminated from one side. On looking into the opposite face one obtains the impression that it is a page of graph paper made up of $^3/_8$ in. squares. When a person walks upon the platform, planting one foot upon the apparatus in the process, some of the rods are momentarily depressed, and the corresponding horizontal lines on the "graph paper" are seen to descend. Since the space between the horizontal lines is exactly the same as the thickness of each rod, a full-size impression is produced of the overlying foot, and the pressure in any region is proportional to the extent that the horizontal lines are depressed. To record the rapidly changing distribution of pressures and the profile of the foot and ankle at any instant, 16 mm. films are made at 30 frames per second, the camera being set 12 ft. from the pedograph. Selected frames are then projected on to cardboard sheets, and those lines that have been displaced are traced in ink. The records are improved by colouring the rectangular area between each depressed line and its original level, and by superimposing an inked outline of the corresponding foot. Typical normal records from two people, one wearing shoes, are shown in fig. 2.

The apparatus may be calibrated by measuring the displacement of the rods under known pressures. It can be used for a quantitative study of normal and abnormal gaits and for analysing the effects of different types of footwear.

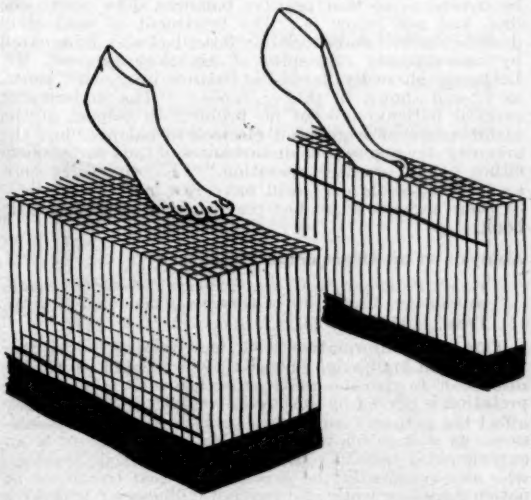

Fig. 1.

I am indebted to Mr. A. L. Wooding for the photographic work.

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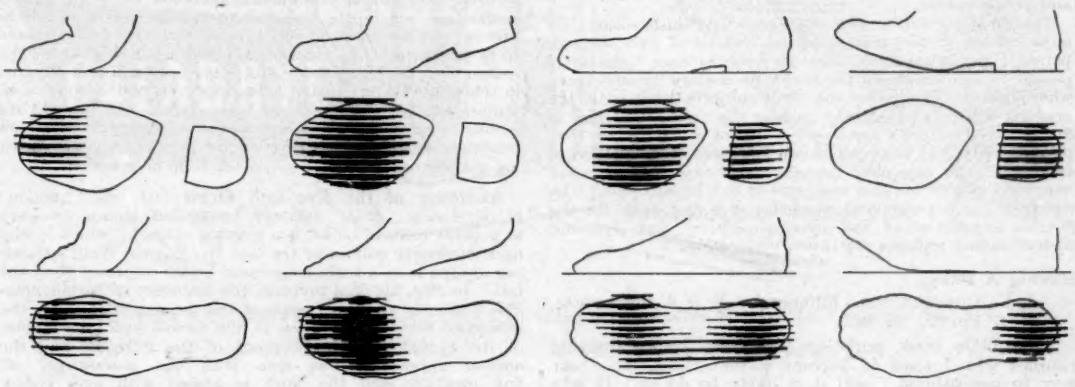

Fig. 2.

Reviews of Books

Fluid Balance in Surgical Practice

L. P. LEQUESNE, M.A., B.M. Oxfd, F.R.C.S., assistant director, department of surgical studies, Middlesex Hospital. London: Lloyd-Luke. 1954. Pp. 130. 17*s*. 6*d*.

THIS monograph should prove an important practical contribution to the task of making the patient safe for surgery, and keeping him safe after the operation. The author has himself studied many of the problems which he discusses, and he now makes his experience available to his surgical colleagues and to students of surgery. The physiological background of this important subject is well summarised, and the illustrations, many of them "Gamblegrams," are numerous and helpful. The diagrams showing electrolyte balance, however, would be improved by a clearer indication in each chart of the direction of "positive" balance; and probably also by inversion, so that positive balances show above the line, and not below it. The treatment of electrolyte disorders is well and succinctly described and illuminated by case-reports. In spite of his close interest, Mr. LeQuesne shrewdly keeps his balance in another sense, as is well shown in this sentence: "The majority of surgical patients present no problem in respect of the maintenance of water and electrolyte balance, but the minority develop serious disturbances of fluid metabolism either before or after operation." This minority—not an inconsiderable one—will have reason to be grateful to their surgeon if he has read and digested this little book.

Analysis of an Obsessional

R. W. PICKFORD, M.A., PH.D., D.LITT., senior lecturer in psychology, University of Glasgow. London: Hogarth Press. 1954. Pp. 234. 21*s*.

THIS is an informative book, not as a technical contribution to knowledge but as a plain account of what is discussed in psycho-analytic treatment, what interpretation is offered by the psycho-analyst, and how it may affect the patient's subsequent acts, dreams, and associations, as well as his mental health. Dr. Pickford is an experimental psychologist, without medical training, who also engages in the psycho-analytical treatment of patients with neurotic and psychotic illnesses; he briefly cites some of the conditions he has treated, to illustrate points in his commentary on the obsessional disorder which is the main theme of the book.

The text contains nothing new for psycho-analysts, but its main interest is for doctors and others who wish to discover what lay analysis, or indeed any psycho-analysis, entails. The prominence of breasts, penis, anus, fæces, and other subjects of regressive fantasy is frankly portrayed, and the reader can follow the stages by which the psycho-analyst deals with these constantly recurring sexual and excretory themes in such a way as to enable the patient to relive his infancy and childhood in the presence of the analyst who serves as a kindly and loving parent.

Dr. Pickford writes with confidence and enthusiasm; he is so certain of the great spiritual and social gain through personal psycho-analysis that he believes that "the more people who are analysed the better for society"; and those who might be revolted by the crude subjects dwelt on in the analysis will find it salutary to bear the therapeutic aim in mind. Dr. Pickford's one case cannot, of course, prove that psycho-analysis is more beneficial than any other method of treatment; his aim is to describe, with explanations, what happened in a favourable case, and in this he succeeds. The rigour of the experimental psychologist is cast aside for the flexible exposition of the psycho-analyst; and dynamic understanding replaces statistical verification.

Having A Baby

J. F. ROBINSON, M.B. Edinburgh: E. & S. Livingstone. 1954. Pp. 92. 6*s*. 6*d*.

THIS little book purposes "to help young married couples who intend to become parents along the best way to parenthood," and it is likely to do so. It sets out in simple language the physiology of human reproduction, the means of promoting or discouraging conception, and the investigation of sterility; it outlines pregnancy, labour, and the puerperium, and advises on diet and hygiene in pregnancy, on behaviour in labour, and on securing medical and nursing care. The expectant mother is told what her attendants are likely to do to and for her, with the reasons. Things are made rather simpler and easier than they are, but this is perhaps a good fault. There are few inaccuracies and no fads. The book can be recommended to patients, without fear of later regrets.

Peripheral Vascular Diseases (2nd ed. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954. Pp. 622. 86*s*.).—This book, written by Dr. W. S. Collens and Dr. N. D. Wilensky of New York, in collaboration with other workers, deals with diseases of the vascular system, excluding those of the aorta, vena cava, and coronary vessels but including affections of the brain and spinal cord. It seeks to cover systematically the structure and function of the peripheral vessels, methods of examination, classification of diseases, diagnosis, and treatment; but we are left doubtful as to the kind of reader that will find in it what he needs, for it is not eclectic enough for the student or occasional practitioner yet it lacks the precision and detail required by the specialist. For example, though many techniques used for passive venous congestion are fully described, there is no mention of Telford's approach to the cervicothoracic chain, and arterial grafting is completely omitted. The printing is delightful and the illustrations are of high quality, though a few of the colour prints are blurred. The quoted literature is almost entirely American.

Lectures on the Scientific Basis of Medicine (Vol. II. London: The Athlone Press, University of London. 1954. Pp. 380. 35*s*.).—In his preface to this second volume, Sir Francis Fraser tells how the lectures in this series come to be given. The British Postgraduate Medical Federation, of which he is director, has entrusted to a committee of heads of departments of its component institutes the task of reviewing those fields of research in which fundamental studies have led to notable advances in our understanding of health and disease. Topics are selected, and people engaged in original research in these fields are asked to lecture on them to young medical research-workers and junior consultants and specialists. Nineteen of the lectures given in 1952–53 appear in this book, which includes articles on antibiotics, corticotrophin, chemical transmission of nerve impulses, preservation of living cells at low temperatures, the use of radio-isotopes, and chromatography—all themes which, Sir Francis tells us, will be developed further in vol. III, now in preparation. Medical science today is unfolding more engrossing serials than any single reader can digest. These volumes have a hint of the old enticing invitation, "Begin here": they give the reader the flavour of many a fine story he may never read in full.

Synopsis of Obstetrics and Gynæcology (11th ed. Bristol: John Wright & Sons. 1954. Pp. 536. 25*s*.).—Mr. Aleck Bourne's tried favourite is with us again, as useful as ever. The author of a medical textbook, as he hints in his preface, is constantly tempted to retain matter which he knows to be outdated, merely because examiners will demand to be informed about the archaic; and it is doubtless for this reason that symphysiotomy and pubiotomy still find a corner in the new edition. In the main, however, and in spite of all temptation, he is off with the obsolete old and on with the worthy new, and the book maintains its strength for just this reason. It is agreeable to see chloroform as an anæsthetic for the parturient woman given the coup-de-grâce.

Anatomy of the Eye and Orbit (4th ed. London: H. K. Lewis. 1954. Pp. 491. 63*s*.).—Anatomy, contrary to popular medical belief, is a growing subject; which is why each successive edition of the late Mr. Eugene Wolff's classic has always been a little longer and better informed than the last. In this, his final revision, the discovery of pacchionian-like bodies in the inner wall of the canal of Schlemm, the difference between the skin of the medial and lateral sides of the eyelids, the development of the vitreous, and the normal appearances as seen with the gonioscope, all find mention, and the work is graced with over eighty new illustrations.

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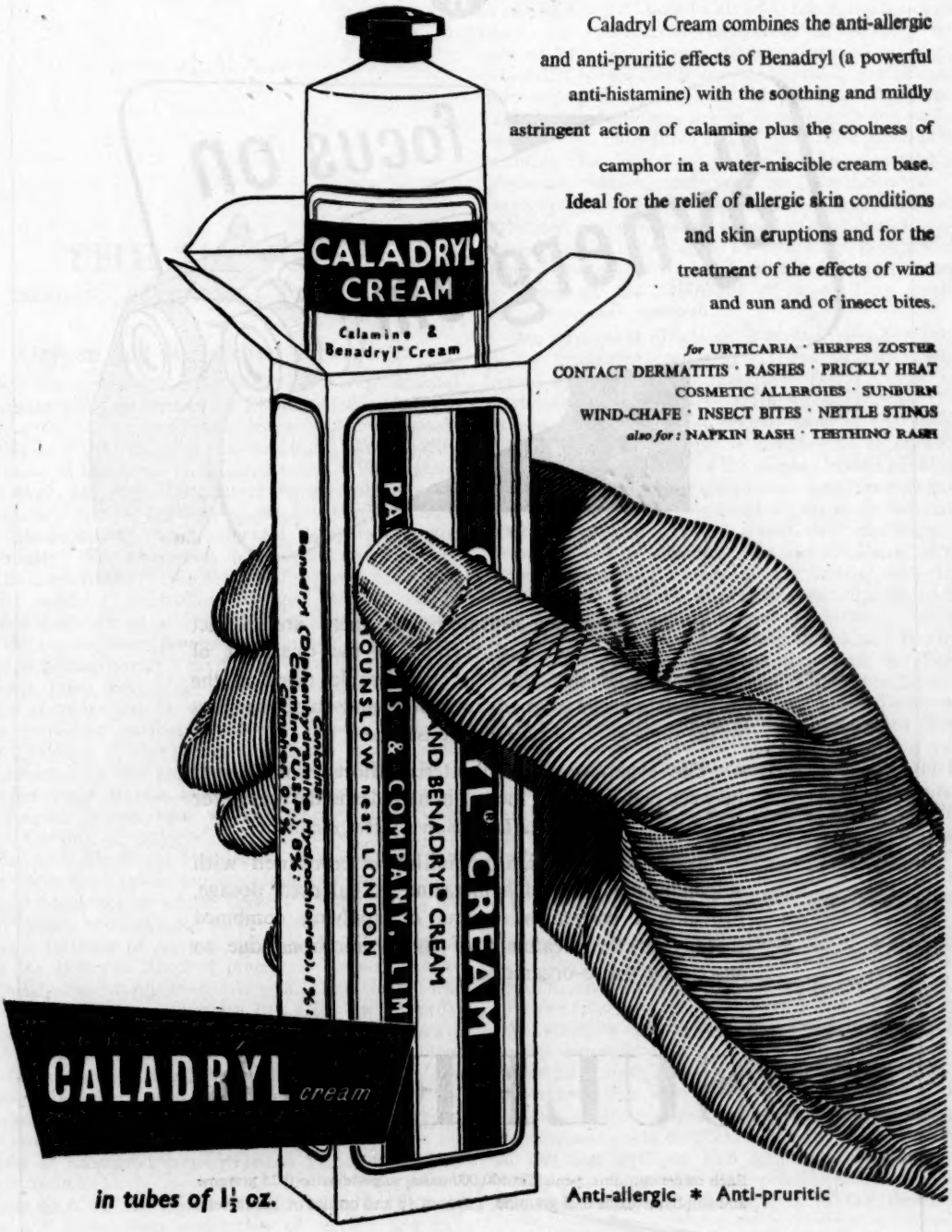

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THE LANCET
LONDON: SATURDAY, AUGUST 7, 1954

Oxygen and Retrolental Fibroplasia

WE lately reviewed [1] the clinical and experimental evidence which has led to the incrimination of oxygen therapy as the primary cause of retrolental fibroplasia—the condition which is responsible for the majority of cases of blindness in children today. We pointed out that, although there might be several unknown secondary factors influencing its development, such as anæmia and environmental temperature and humidity, the prevention of the disease appeared to be a relatively simple matter of severely restricting and carefully controlling oxygen administration. There was some anxiety, however, that such a revision in the treatment of premature infants might lead to a rise in mortality-rate. So it is encouraging to hear the recent news that this fear seems unfounded: not only is reduction in oxygen exposure resulting in the expected extinction of the disease, but the survival-rate of the premature infants is apparently unaffected by the new policy. For example, on an earlier page of this issue Dr. FORRESTER and his colleagues report that since October, 1951, when the amount of oxygen used for each infant was restricted, retrolental fibroplasia has disappeared from two premature-infant nurseries in Manchester, whereas 83 children (21 of whom became totally blind) had previously been affected in the same units when high concentrations of oxygen were used as a routine.[2] At the Bellevue Hospital premature nursery a series of infants was divided into two groups and treated with either high (approximately 70%) or low (approximately 40%) concentrations of oxygen. 8 cases of severe retrolental fibroplasia (6 causing total blindness) appeared in the 36 surviving infants of the first group, but there were none at all in the 28 surviving infants in the second group. At this hospital oxygen is now given only to definitely cyanotic infants and then at measured concentrations below 40%; and the treatment is stopped at the earliest possible moment.[3] At the Johns Hopkins Hospital, GORDON et al.[4] found that restriction of oxygen led to a considerable decrease in the incidence of retrolental fibroplasia over a two-year period; there were no permanent ocular changes among infants who received 40% oxygen or less. These excellent results have been achieved without detriment to the survival-rate. In Montreal, LOCKE [5] noted a striking fall in the incidence when the routine administration of oxygen was reduced to a minimum; changes occurred in only 2 out of 124 babies (both were mild cases), yet 32 cases were expected on the basis of previous experience. These clinical findings are in accord with the earlier reports.[6–10] Thus there can be no further grounds for doubting the danger of oxygen in the treatment of premature babies, and once its administration is universally controlled along the lines suggested in the published reports the incidence of retrolental fibroplasia should be reduced to relatively insignificant proportions, and this sad chapter in therapeutics will be closed as the fulfilment of more than twelve years' intensive research.

Two important questions, however, remain: what is the mechanism whereby oxygen induces pathological changes in the immature retina; and can retrolental fibroplasia arise through causes other than oxygen exposure? The current issue of the *British Journal of Ophthalmology* is devoted to accounts of the experimental study of the disease, and the findings go far to answer these questions. Last year ASHTON and his co-workers [11] reported a previously unknown action of oxygen: it was found that conditions of hyperoxia led to a complete or partial closure of the developing retinal vessels of the kitten, and there followed intravascular coagulation or adhesion of the vessel walls so that the retina was left virtually without a blood-supply. On transferring the animal to air, a profuse and disordered neovascularisation developed, producing a pathological picture exactly analogous to the early stages of retrolental fibroplasia. There were thus two essential phases in the development of the disease: vaso-obliteration in oxygen followed by vaso-proliferation in air. These workers now report the full details of their experimental work, the long-term results of these changes, and the conditions which affect the extent of the vaso-obliterative and vaso-proliferative phases; and they describe experiments designed to elucidate the mechanisms involved.[12–14] The severity of vaso-obliteration is inversely proportional to the maturity of the vessels and cannot be produced once the retinal vasculature is fully mature. It is directly related to the duration of exposure to oxygen, and about thirty-six hours are required to produce total irreversible obliteration in animals of the most sensitive age. Vaso-obliteration is directly related to the concentration of oxygen, and concentrations below 35% have little or no effect. ASHTON and his colleagues have demonstrated that in the full-term kitten the vaso-obliteration is restricted to the developing retinal vessels, but this may only be an expression of the fact that, at this age, budding vessels are confined to the retina. The possible action of oxygen on growing extra-ocular vessels in the developing

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14. Ashton, N., Cook, C. *Ibid*, p. 433.

mammalian embryo are unknown. That this is not an effect on growing vessels per se is shown by the fact that hyperoxia has no influence on new vessels in the rabbit cornea or in the rabbit ear-chamber, whereas it does obliterate vessels in the retina of the young rabbit.[13]

ASHTON and COOK [14] describe a new technique whereby the retinal vessels in the living animal may be studied microscopically : the anterior ocular structures are replaced by a glass window, and when the animal is placed in a plastic container the effect of varying concentrations of oxygen on the vessels may be observed in detail. By this method they have noted an immediate severe vasoconstriction, developing within five minutes and relaxing again in ten minutes, to be followed by total vaso-obliteration after about eight hours' exposure. A point of particular interest was that the retinal vessels apparently became completely immune to oxygen when retinal detachment developed. The phase of vasoproliferation has also been extensively studied, and it has been found that, although the early stages of this process exactly parallel stage I of retrolental fibroplasia, retinal detachment does not occur in the kitten as had previously been thought. The whole retina revascularises, the intravitreal vessels gradually disappear, and vision is apparently little affected by the disturbance. Several factors which might influence this course of events were investigated, and it is noteworthy that the administration of ethyl biscoumacetate ('Tromexan') to animals subjected to hyperoxia prevented intravascular coagulation and permitted reopening of the collapsed vessels on transfer to air. ASHTON et al.[13] therefore suggest that anticoagulants may be of value in cases of severe asphyxia where the risk of exposure to high concentrations of oxygen must be taken. In such circumstances, however, high ambient oxygen concentrations are less likely to be reflected in the circulation; and, judging from the satisfactory results already being obtained simply by restricting oxygen, the use of anticoagulants, with its attendant dangers, is unlikely to find a practical application.

When the exhaustive work on retrolental fibroplasia is reviewed, it is apparent that one of the main reasons why attention was diverted from what now appears to be the obvious importance of oxygen was the reported occurrence of the disease in infants who received little or no additional oxygen after birth. But it is clear that vasoproliferation—the basis of the condition—is by no means a specific reaction, and theoretically it could equally well arise in any circumstances of severe retinal anoxia, of infection, or even of hormonal disturbance—just as retinitis proliferans develops in a variety of unrelated retinal diseases. The importance of these other factors will not become apparent until the oxygen-induced form has been removed, for, although the evidence so far available suggests that causes other than oxygen will prove relatively unimportant, sporadic forms of the disease may well be uncovered as oxygen therapy comes under control. Should this be so, the ætiology of these cases will prove a fascinating study for the future. Quite apart from the question of retrolental fibroplasia, the vascular events occurring in hyperoxia and hypoxia raise points of fundamental importance. An understanding of the biochemical processes involved will probably add much to our knowledge of other ocular diseases of which vasoproliferation is a feature, and it may well shed light upon the nature of the stimulus to capillary growth in general.

Hypoglycæmia in Children

SPONTANEOUS hypoglycæmia may be due to many different conditions.[1] CONN [2] has classified the causes into two main groups—organic and functional—and a third, miscellaneous, group which includes such conditions as starvation and self-induced hypoglycæmia from insulin injections.

In the organic group the most important condition is islet-cell tumour of the pancreas, usually benign but occasionally malignant. In such cases the patient has attacks of impaired consciousness or bizarre behaviour after brisk exercise or abstinence from food. During attacks the blood-sugar level is usually less than 50 mg. per 100 ml., and the attacks themselves can be promptly terminated by administration of glucose. The tumour or tumours may sometimes be very difficult to find, and it is thought that diffuse hyperplasia of islet tissue may give rise to the same syndrome.[3] SKILLERN and RYNEARSON [4] are doubtful about this, and they suggest that in some of the reported cases more careful search might have revealed a small tumour; they cite one case where re-examination of an excised pancreas revealed an adenoma that was only 2 mm. in diameter. Spontaneous hypoglycæmia may also occur in Simmonds's disease,[5] Addison's disease,[6] and severe liver disease.

Functional hypoglycæmia is commoner and occurs in persons who are highly strung, thin, subject to alimentary upsets, and prone to react to mild infections with high fever—the type described so well by CAMERON in *The Nervous Child*.[7] The hypoglycæmic attacks come on at any time but particularly at times of stress. They do not usually occur before breakfast, and the attacks, unlike those due to islet-cell tumours, do not get progressively worse or more frequent; in children, they often gradually diminish and in the end may cease entirely.[8] The fasting blood-sugar level may be normal or raised, and a glucose-tolerance test shows a normal initial response with a fall to hypoglycæmic levels after three to four hours. This test can be relied on only if it is carefully standardised by the patient taking a high-carbohydrate diet for three days beforehand. CONN [2] believes that functional hypoglycæmia is due to overproduction of insulin in response to an alimentary rise in blood-sugar level. Attacks may be prevented or diminished by a high-protein, high-fat, low-carbohydrate diet, with which the slow conversion of amino-acids into glucose tends to stabilise the blood-sugar level. It is, of course, equally important to avoid such precipitating factors as excitement and anxiety; and, in children, the general orderly management of the patient's life will do much to prevent attacks without any special dietary measures.

1. See *Lancet*, 1950, ii, 919.
2. Conn, J. W. *J. Amer. med. Ass.* 1947, **134**, 130.
3. Graham, G., Oakley, W. G. *Quart. J. Med.* 1950, **19**, 21.
4. Skillern, P. G., Rynearson, E. H. *J. clin. Endocrin.* 1953, **13**, 587.
5. Sheehan, H. L., Summers, V. K. *Quart. J. Med.* 1949, **18**, 319.
6. Rushton, J. G., Cragg, R. W., Stalker, L. K. *Arch. intern. Med.* 1940, **66**, 531.
7. Cameron, H. C. The Nervous Child. London, 1946.
8. Wilkins, L. The Diagnosis and Treatment of Endocrine Disorders in Childhood and Adolescence. Springfield, Ill., 1950.

McQUARRIE [9] has drawn attention to another type of spontaneous hypoglycæmia affecting younger children. The attacks are more severe, and there is a high familial incidence. Of the 25 cases that he cites, 21 first had symptoms before the age of two years; and in the most severe cases symptoms started at less than ten months of age. 11 of the patients had brothers or sisters with the same type of disorder. The presenting symptom was a convulsion, varying from a major epileptic attack to a "wilting spell" characterised by a blank stare followed by rolling of the eyes. Some of the patients had been thought to have idiopathic epilepsy, though treatment with anticonvulsant drugs had been unsuccessful. Investigation showed a low fasting blood-sugar level; and glucose-tolerance tests showed a normal rise from the low fasting levels with a fall to hypoglycæmic levels in one or two hours. Tests of adrenocortical and pituitary function were normal, and there was a normal rise in blood-sugar level after an injection of adrenaline, confirming that liver glycogen was both present and available. In 2 of the cases where biopsy of the pancreas was done, alpha-cells were absent or very few,[10] but in others this abnormality was not found. Some of the children had undergone extensive resection of the pancreas, which had not notably improved their condition. Others who had been treated with a high-protein low-carbohydrate diet had similarly failed to improve. The most serious effect of repeated or long-continued hypoglycæmic attacks is damage to the brain, and McQUARRIE has seen 7 children who have suffered such damage; 4 had spontaneous hypoglycæmic attacks (the other 3 had had overdosage of insulin in the treatment of diabetes mellitus). Once other causes of hypoglycæmia have been excluded, the condition described by McQUARRIE may be treated with corticotrophin, which appears to act like a specific agent. The best dosage has not yet been decided; but at present treatment is started with 4 mg. per kg. of body-weight per day, given in four divided doses at six-hourly intervals for four days. For the following week the dosage is reduced to 1 mg. per kg. every twelve hours in the form of the long-acting gel. Thereafter if the fasting blood-sugar level remains normal the morning dose is omitted. The aim is to keep the patient free of symptoms with a fasting blood-sugar level above 40 mg. per 100 ml., and further adjustments of dosage may be needed to achieve this. After a variable time it may be possible to discontinue the drug, since spontaneous cure sometimes occurs. In other cases very small maintenance doses may be required.

Convulsions in infancy and early childhood are common enough. Now that spasmophilic rickets has almost disappeared, convulsions of which the cause is not immediately apparent are often termed "febrile," even though evidence of co-existing infection may be equivocal and a convulsion itself may lead to a rise in body-temperature.[11] If the convulsions occur frequently without obvious cause, idiopathic epilepsy may be diagnosed and treatment with anticonvulsant drugs prescribed. But the diagnosis of idiopathic epilepsy is a confession of ignorance, and an underlying cause should always first be sought. Spontaneous hypoglycæmia is easy to diagnose once the condition is suspected, and, if McQUARRIE's findings with corticotrophin are confirmed, permanent brain damage may be prevented.

9. McQuarrie, I. *Amer. J. Dis. Child.* 1954, **87**, 399.
10. McQuarrie, I., Bell, E. T., Zimmerman, B., Wright, W. S. *Fed. Proc.* 1950, **9**, 337.
11. Lennox, W. G. *Pediatrics*, 1953, **11**, 341.

The Unoccupied Bed

Two years ago the King's Fund Hospital Administrative Staff College set out to consider the better use of hospital accommodation, and its study group have now produced some conclusions [1] which give a useful lead. The subject is important if only because any claims made for extensive rebuilding of the hospitals will invite serious criticism until it is clear that the maximum use is being made of what beds there are. In their report on London hospitals in 1945, Sir ARCHIBALD GRAY and DR. ANDREW TOPPING noted that the beds in existence appreciably "exceeded the need and yet the need was not being adequately met"; and this situation persists today, with relatively low occupancy in one hospital and a long waiting-list at another nearby. Indeed, the uneven pressure of waiting-lists is a striking feature of the present hospital pattern.

One reason for waiting-lists is that so many hospital beds are no longer in use, mainly through shortage of staff. Thus 113 wholly or mainly general hospitals in the London area, with a nominal complement of 33,000 beds, had in 1951 no fewer than 6000 unavailable beds, half of which were related to 31 of the larger hospitals, none of which showed any real pressure from waiting-lists. But this figure of 6000 is highly misleading; for many of these beds were in old-fashioned, even derelict, wards, closed during the war and perhaps now used for other purposes such as stores or linen-rooms. Though some of this former accommodation could be used for special units, much of it could not be reoccupied by patients with advantage unless the hospital's ancillary departments (e.g., radiology and pathology) were enlarged to deal with the extra work characteristic of post-war medicine. It would be a good thing to have all these allegedly unoccupied beds looked at critically so that we could have some more realistic figures than those given in the parliamentary answer on p. 294. The occasion might also be taken to revise the present system under which the salaries of hospital administrators are related to the number of beds in their charge. Administrators can scarcely be expected to take pains to reduce their official complement of beds if the effect of doing so is to reduce their income but not their responsibility; and much would be gained by introducing a more comprehensive system of grading hospitals for salary purposes.

Redistribution of waiting-lists is in theory simple, but in practice is apt to fail because people want to go to the hospitals with the best reputation. The only real solution lies in the steady improvement of the less satisfactory hospitals. But it is not enough to improve the staffing and enlarge ancillary departments: one must also study appearances. Hospitals which were formerly drab and forbidding from the

1. Hospital Bed Occupancy: Report of the First Study Group set up by the Hospital Administrative Staff College of King Edward's Hospital Fund for London (2, Palace Court, W.2). The members were: the Hon. Mrs. CAMPBELL-PRESTON (chairman); Mr. S. W. BARNES, F.H.A.; Mr. B. BENJAMIN, F.I.A.; Mr. FRANK CHAMBERS, F.H.A.; Mr. P. H. CONSTABLE, F.H.A.; Miss C. H. S. DOBIE, S.R.N.; Mr. W. E. HALL, F.C.I.S.; Dr. P. M. HIGGINS; Sir WILSON JAMESON, F.R.C.P.; Mr. R. A. MICKELWRIGHT, F.H.A.; and Mr. MICHAEL HAY (secretary).

outside have often managed, at small expense, to give themselves a better character to the passing public. (A notable London example of this is the removal of a high wall outside the Paddington Hospital so that the hospital gardens now add a much-needed touch of colour to the Harrow Road.) So long as patients can choose their hospital, our efforts to redistribute waiting-lists must take account of what people think.

The other line of approach is to make fuller use of the effective beds; and this still seems to be possible even in the busiest hospitals. Here one of the first essentials is to agree on appropriate terms and measurements which denote bed usage, and the King's Fund study group recommend three yardsticks—turnover, length of stay, and turnover interval. (The turnover interval is the average number of days a bed lies vacant between successive patients, and it is a less fallacious measure than the percentage bed occupancy.) On the admission of patients they make a number of practical suggestions which may help to speed turnover. They do not favour a casualty-receiving ward, but prefer emergency admissions to go straight to the ward where they are to be treated: if this ward is full, one of the patients nearing discharge should be transferrred to make room. Many hospitals are now "booking" cases instead of putting them on the waiting-list, and where this can be done it is much better for the patients. Where waiting-lists are long, patients should be notified when nearing the top of the list; and, for administrative ease, an admission office greatly assists smooth running. The average length of stay may sometimes be lessened by more detailed forward planning of the diagnostic arrangements, for too much time is still lost by inpatients in waiting for special examinations, particularly radiological. Excluding gynæcology wards, most hospitals have an equal number of male and female beds, but the pressure for beds may differ greatly in different departments and at different times, with the result that some beds are in great demand when others are not. One way of getting over this is to put more of the beds in cubicles, which permits more flexibility in distributing the sexes. Another possible means of increasing flexibility is to have a "fluid" or "buffer" ward, taking patients from whichever main department is under greatest pressure at the time. The development of recovery homes to allow earlier discharge of patients has lately been discussed in another King's Fund report.[2] Among important details considered by the study group at the staff college is the potential economy of getting wards redecorated and cleaned rapidly by outside contractors rather than slowly by the hospital maintenance staff. The work can be done during the few weeks when there is least demand on the beds.

It is probably true that every hospital could still improve its turnover, with benefit rather than harm to its patients, if it were to make a further detailed review of its long-established practices and a close examination of quarterly (rather than monthly or yearly) returns—as recommended in this report. The waiting-lists are a continuing anxiety, but some relief would certainly come of a concerted effort in all regions.

2. See *Lancet*, 1954, i, 1280.

Annotations

POPULATION STRUCTURE

THE habit of preparing for the worst, even if it is still forty or fifty years away, is now so strong in us that few dare ask whether, in fact, any alternatives are offered. In his presidential address to the Congress of Gerontology [1] Dr. Sheldon spoke of the trouble likely to come to us as a result of a falling birth-rate and a greater expectation of life. He quoted estimates that by 1977, if present trends in mortality-rates continue, there will be 8·2 million old people in the country—some 3 million more than we have at present—and he suggested that the average duration of incapacity in these old people will presumably match that of old people today. If medicine succeeds in reducing deaths from neoplasm or degenerative vascular diseases the situation may be even worse than this (or, as any of us then surviving may think, better). Is there no rift in these clouds? Political and Economic Planning (P.E.P.) [2] have examined the prospect afresh, and find some reasons for thinking that the sky may not be quite as black as it is painted.

Taking 65 as the retiring age for men and 60 for women, it can be said truly that in 1911 there were 67 people over retiring age in every 1000 of the population (or 1 in 15), and that in 1951 there were 135 per 1000 (or 2 in 15). When it comes, however, to saying that in 1977 there will be 195 per 1000 (or nearly 3 in 15) the evidence is less secure. This estimate assumes that the annual increase in old people will go on rising, as it has done in recent years; but in fact, P.E.P. argue, it is not likely to be much higher in the future than it has been in the recent past, and may be rather less. We are in the act of shifting over from a rapidly growing population with a high mortality to a roughly stationary population with a low mortality. The estimate of 195 per 1000 is made on the assumptions that the annual number of births will have fallen to 600,000 in 1961, and that it will go on dropping by a further 1000 a year after that date. In fact the number of births is subject to fluctuations: it fell between 1947 and 1952, but rose by 9000 in 1953. It may be more valid, P.E.P. think, to assume that roughly the present number of births will be maintained in the next few years than to assume a steady decline. The estimate also assumes that the mortality-rate of those over retiring age will decline in the next 40 years until it is only 70–80% of the rate in 1946–50. The decline of the rate in the older age-groups in recent years, however, has been largely due to the effect of antibiotics on the respiratory diseases, and there is a limit to benefits to be gained in this way. No such dramatic reduction in the killing power of the degenerative diseases can at present be foreseen. The expectation of life at birth is now 66 and 71 for male and female respectively (as against 44 and 48 fifty years ago), but, as we have said before,[3] those in the younger age-groups have drawn the big prizes. A man reaching 60 can now expect to live another 15 years, but even his grandfather, at that age, could hope for 13½ years. A woman of 60 can now expect another 18 years; fifty years ago her grandmother expected 15. Such gains are nice but not spectacular. If, as P.E.P. suggest, it can be assumed that the annual number of births and the mortality-rate—anyhow at advanced ages—remain about constant, then the number of people over retiring age in 1977 will not be 195 per 1000 but only 160.

Still, this means that (unless retiring ages are changed) there will be about 2 million more people to be maintained by those in the productive years; and it is generally assumed that these will be a rapidly diminishing

1. Sheldon, J. H. *Lancet*, July 24, 1954, p. 151.
2. Providing for Pensions. *Planning*, 1954, **20**, no. 364. From P.E.P., 16, Queen Anne's Gate, London, S.W.1.
3. *Lancet*, 1951, ii, 623.

proportion of the population. But will they? In 1891, 60% of the population were in the working group between 15 and 65. By the 1930s, largely because fewer children were being born (and even though many more were surviving), the working age-group had risen to about 66% of the population. By 1952—what with the greater number of births after the war, and the increase in people over retiring age—the percentage had dropped to just under 64. The Registrar-General estimates that in 1962 they will be 63%, and by 1972 62%. By that time the population in the productive age-group will have risen by over half a million; the estimate assumes, however, that there will be 1 million fewer children under 15, and 3 million more people over retiring age (as against the 2 million suggested by P.E.P.). The burden, in any case, does not appear intolerable, and still compares favourably with that borne in 1891. Moreover, the numbers of people in the productive age-group who are actually doing any work seem to be on the increase. Since the years before the late war the numbers in civil employment have gone up by more than 2 million, despite little change in the size of the group as a whole. The change in ratio between producers and non-producers is thus likely to be very slight in the coming years, and may even, P.E.P. suggest, be in a favourable direction.

FAIR, FAT, FERTILE, AND FORTY

THE aphorism that the patient with gall-stones is commonly a "fair, fat, fertile female of forty" dies hard, and there is good reason to suspect that its popularity has depended more on its attractive alliteration than on its veracity. As long ago as 1922 Gross [1] showed from a study of necropsy records in Leeds that the influence of pregnancy on the formation of gall-stones was not significant. Most women with gall-stones have borne children, but so have most women in the general population. Cholelithiasis, like many other diseases, is commoner in the later years of life; but the diagnosis cannot be excluded because of age in young adults or even in children. Griffin and Smith [2] have shown that nearly a third of a consecutive series of cases of gall-bladder disease in a well-defined community were under 40 years of age, and Glen and Hill [3] remind us that it does occur, though rarely, in children. The disease is certainly commoner in women than in men, but over-emphasis of this point has unfortunately obscured the correct diagnosis in many men with gall-bladder disease—especially those with hyperchlorhydric dyspepsia. The tendency to misdiagnose the dyspepsia of early gall-bladder disease in men may be responsible for the relatively higher proportion of men who present with complications; Waugh and Cain [4] report that of 175 patients with common-duct stones 67 (38%) were men. If the aphorism's "fertile female of forty" is to be discarded, few will wish to preserve the "fair" and "fat."

In this country the incidence of gall-bladder disease has been little studied of recent years. Rentzhog [5] has observed that in many large hospitals in Sweden cholecystectomy has become two or three times more common since 1948. In his own hospital the proportion of cases of gall-bladder disease among surgical admissions has increased from 2½ to 7%. In the absence of any significant change of surgical opinion about the management of the disease, and allowing for an increase in operations on older and bad-risk patients, he concludes that the figures must reflect a greatly increased incidence. In the same period the proportion of patients with gall-bladder disease admitted to hospital with acute cholecystitis has fallen from about 75% to about 50%. This suggests that there has been some modification in the practice of the doctors who refer cases; but Rentzhog believes that this alone would have produced a more gradual change and that the sudden increase about 1948 is more probably due to changes in diet after the removal of war-time restrictions. He suggests that the change to a diet rich in fat gave rise to symptoms in many patients who previously had silent gall-stones.

It will be interesting to see whether a similar increase in gall-bladder disease has followed the longer-delayed removal of diet restrictions in this country.

1. Gross, D. M. B. *J. Path. Bact.* 1922, **32**, 503.
2. Griffin, G. D. J., Smith, L. A. *J. Amer. med. Ass.* 1954, **154**, 731.
3. Glen, F., Hill, M. R. *Ann. Surg.* 1954, **139**, 302.
4. Waugh, J. M., Cain, J. C. *J. Amer. med. Ass.* 1954, **154**, 734.
5. Rentzhog, U. *Nord. med.* 1954, **51**, 384.

TELEVISION AND HEALTH

Now that sponsored television in this country is inevitable, it may be useful to look at the way such a service is used, in the United States, to disseminate health teaching. Departments of public health there are already arranging single programmes and series; and accounts of three such series—in Washington, D.C., Denver, and Grand Rapids—have recently appeared.[1] American television stations, though licensed by the State, are presumably set up by private enterprise; and in applying for licences, those setting up stations indicate how much time they are expecting to allocate for "public service." This is not a matter of regulation: they are not required by law to allot any definite amount of public service time; apparently they do it by courtesy and custom. Naturally there are a great many demands on such time, since many agencies compete for it. Thus it falls to health officers to persuade and convince television-station officials that the information they wish to give the public is valuable, and that the station will be collaborating in a worthy social service. This in itself may do good, for nothing clears the head about a cause like having to convince others of its importance. But in any case, public-health departments can hardly help giving information of general interest; as Mr. Truman J. Keesey, writing on the Washington programmes, remarks: "No topic is so important or so interesting as the facts surrounding birth, life, human development—the actions, reactions and interactions of people—and those leading to death. These are the substance of the bulk of all literature."

He describes three television series—one on the emotional problems of adults (called "Face to Face"), one on alcoholism, and one on venereal disease. Denver produced telecasts on a variety of subjects—blood banks, alcoholism, rheumatic fever, cancer, rabies control, bicycle safety, misuse of medicine, and many others; and Grand Rapids had a similarly varied programme. The writers of all three articles agree that success depends on the collaboration of the public-health and television staffs, the first supplying knowledge of public-health subjects, the second knowledge of production and presentation. A telecast lasting 15 minutes may need months of preparation. The health department collects case-material, patients, doctors, technicians, and auxiliary workers engaged in the field to be illustrated. The planning committee for the "Face to Face" series included psychiatrists, psychologists, psychiatric social workers, a vocational rehabilitation counsellor, leaders of community organisations, and the health educator from the health department, who prepared the scripts. Later the television station appointed a co-producer, a director, and a narrator to work on the series. The telecasts were given live because filming is expensive and slow, and live people, in any case, make a livelier appeal to an audience. Some of those used were actors, but most were members of the public-health staff and actual patients. The aim of the series was to help individuals to understand their emotional problems, to tell those needing help where to find it, and to build up support for a community mental-hygiene programme. All the programmes were favourably received by the public,

1. *Publ. Hlth Rep., Wash.* 1954, **69**, 599, 606, 608.

and there were many requests for advice and for copies of scripts. The venereal-disease series was followed by a slight increase in clinic attendance, and while it was running the percentage of new admissions to hospital who had seen the programmes rose from $2^1/_2$ to 5.

The concept of "public service time" has as yet no place in this country. The British Broadcasting Corporation and their television section are generous, however, in giving space to medical and public-health programmes. The new authority foreshadowed for sponsored television will not be exactly comparable to the promoters of television stations in America; but it might well be encouraged to take over this idea of public service time, to be used for educational programmes, whether medical or other. It is hard to see how else, under sponsored television, many such programmes are to find their way to the screen.

ODDITIES IN GRANULAR LEUCOCYTES

ABNORMALITIES in the physical structure of mature leucocytes, as seen in fixed and stained blood or marrow films, have never excited the same interest as similar abnormalities of erythrocytes. The reason is fairly clear. Anomalies of size, shape, and properties in the red blood-cells are linked with definite clinical syndromes—spherocytosis with an inherited hæmolytic syndrome, microcytosis with iron-deficiency anæmia, and so on. Exploration of the biochemical causes of some of the hereditary erythrocyte anomalies has brought to light information of genetic as well as of hæmatological interest—for instance, the inheritance of abnormal hæmoglobin found in the sickle-cell anomaly. Abnormalities of mature leucocytes have, on the contrary, not been linked with specific syndromes.

Some of these anomalies run in families. The best known is the "Pelger-Huët" anomaly in which the neutrophil polymorphs have never more than two lobes to their nuclei and 30% of them may be "band" forms. Tilestone [1] showed that this anomaly was inherited in a dominant fashion; even so it does not seem to be linked with any definite lesion. But in rabbits with this anomaly Nachtsheim [2] found that homozygotes grew slowly and showed severe skeletal abnormalities. Another dominant anomaly is that described by Alder [3] in which all the granulocytes have basophilic staining of their granules; this, too, seems compatible with normal survival, but the leucocyte-granule anomaly that Reilly [4] noted in 4 out of 8 patients with gargoylism is probably an example of Alder's anomaly. Undritz [5] described a family with hypersegmented polymorphs, and they too were quite healthy. Hegglin's syndrome [6] is rather more complex: the neutrophil and eosinophil granulocytes had in their cytoplasm some odd elliptical bodies staining bright blue, up to 5 μ long and 1–2 μ thick, which have been dignified by the portentous names of Döhle or Amato bodies; in addition there was thrombocytopenia with some of the platelets showing gigantism and other structural anomalies, being as large as red cells. Hegglin found that the megakaryocytes in the marrow showed an unusual coarse granulation of their cytoplasm. In Hegglin's affected family the father and two sons showed these anomalies, but they remained quite healthy. Chediak [7] observed anomalous leucocytes in 4 children of a family of 13. The cytoplasm contained Döhle bodies and the granules were very large; the nuclei were malformed or pyknotic. The affected children were albinos, suffered from photophobia, and all died in their 7th year. Leitner, Neumark, and Heeres [8] have described a case of Hegglin's anomaly in which the patient died; no other member of the family was affected. Unfortunately the clinical and laboratory information is scanty, and there was no necropsy. It is not clear whether the patient died from primary purpura associated with the platelet anomaly, or whether he died from an infection and his anomaly caused an odd response.

Our knowledge of the hereditary anomalies of leucocytes is still primitive. An attempt to learn a little more about an acquired anomaly—the so-called "toxic granulation" of leucocytes—has been made by Gordin.[9] It has been known for over fifty years that in infectious diseases the granules of the polymorph leucocytes are often relatively scanty and stain darkly. These alterations were closely studied to see if they afforded any clues to the prognosis or the severity of the infection. Later, similar alterations in the cytoplasmic granules of leucocytes were noted in patients treated with X rays or radium, in toxæmias of pregnancy, in severe disease of the liver, and in some other conditions. As a result of these studies the presence of toxic granules was taken to indicate a toxic interference with the maturation of granulocytes; and it was regarded as a sign of poor prognosis. Gordin studied living polymorphs by dark-ground illumination, and he confirmed previous observation that the "granules" that are so prominent a feature in stained and fixed cells are actually droplets of a liquid substance. These droplets are connected together by threads or bridges, and, as Ivan Wallgren had noted, the droplets and their bridges form a communicating system that in the healthy cell maintains its constituents at a constant size. Living granulocytes from patients showing toxic granulation by the usual methods are found to have a proportion of large coarse droplets which are still joined together. By exposing normal granulocytes to unphysiological conditions, or to toxic substances such as vital stains, Gordin produced these large droplets, which increased in size and number with continued exposure of the cell to adverse influence. At the same time the cells showed other signs of distress, including impaired amœbic activity and pathological pseudopod formation. Gordin therefore thinks that toxic granulation means that the cell has been damaged and has nothing to do with disturbances of maturation. In fact he believes that toxic granulation is a process parallel to the "cloudy swelling" seen in the cells of fixed tissues such as the kidney.

Davidson and Smith [10] have lately described a difference between the two sexes in polymorph leucocytes. They illustrate a nuclear "appendage" of drumstick shape attached to the lobulated nucleus of the mature polymorph in females, but not in males. The appendages are not seen in every cell; on average they occurred in 1 out of 38 cells, but the proportion affected varied from 1 in 6 to 1 in 98. The age of the female had no influence; the appendages were found in infants and the aged. Males may show nuclear appendages, but they are not of the characteristic drumstick type found in the female. This method of sexing blood has an obvious medicolegal application, and the discovery links up with evidence from the study of insects about the richness of chromatin associated with the X-chromosome.

Reviewing the rôle of the white blood-cells in health and disease, Doan [11] reasonably says that we shall not make much progress until we learn "the metabolic secrets of the white blood cells as fully as we know those of the red cells." Many workers are now applying histochemical and biochemical techniques to these studies, and it is perhaps by these methods that we shall get firm knowledge about the hereditary and acquired anomalies of leucocytes.

1. Tilestone, W. *Ann. intern. Med.* 1937, **11**, 675.
2. Nachtsheim, H. J. *Heredity*, 1950, **41**, 131.
3. Alder, A. *Arch. klin. Med.* 1939, **183**, 372.
4. Reilly, W. A. *Amer. J. Dis. Child.* 1941, **62**, 489.
5. Undritz, E. *Fol. hæmat., Lpz.* 1943, **67**, 249.
6. Hegglin, R. *Helv. med. acta* 1945, **22**, 439.
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Special Articles

RHEUMATISM
THE AMERICAN SCENE

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AMERICAN popular opinion often pictures the British Islanders as frequently shrouded by fog and damp, and in consequence suffering more than do Americans from rheumatism. In reality there seems to be little difference between the two countries. As in Britain, about 9% of the adult population complain of rheumatism, of whom about 1 in 3 have medically attested rheumatoid arthritis.[1] Valid comparisons cannot be made with certainty, because figures for the prevalence of rheumatism in the U.S.A either are based on large and representative surveys (e.g., that of Woolsey [2]) that do not have the benefit of accurate diagnosis, or else arise from hospital experience, with more reliable diagnoses but not constituting a fair sample. Figures such as those of Kellgren and co-workers,[3] accurate both for diagnosis and sampling, are not so far available for the U.S.A.; but work on these lines is in progress at Pittsburgh, where Cobb plans to compare various techniques for measuring the incidence of arthritis in a sample population. An evaluation of "morning stiffness" has already shown that this is surprisingly reliable when used as a screening test question in case-finding in rheumatoid arthritis.[1] The sample-survey method of counting the numbers of rheumatic sufferers seems particularly applicable in America for the investigation of ætiological factors. Between Alaska and Florida the United States contains almost every conceivable type of climate, racial group, degree of urbanisation, and general economic level. The influence of these and other factors on the prevalence of rheumatic diseases is an open field for this type of study.

Estimates of the annual cost of treatment of the rheumatic diseases, based on 1939 figures, put it at about £33,000,000 per annum,[4] with an unknown amount, maybe £160,000,000 per annum, as the cost to industry of losses in production. In contrast, annual investment in research into the rheumatic diseases (including rheumatic fever), though admittedly difficult to estimate, was about £300,000 in 1949 [5] but today approaches £1,000,000 per annum. In 1939 two-thirds of this money went to research in rheumatic fever, and only a third to chronic arthritis. These proportions are changing so that funds available for research on chronic arthritis have probably multiplied about five times in the last five years. Part of this increase is represented by the National Institute of Arthritis and Metabolic Diseases at Bethesda (set up 1951) and another part results from increasing public support for fund-raising activities of the national lay-medical organisation, the Arthritis and Rheumatism Foundation.

Medical Resources

The American Rheumatism Association, founded in 1930, has about 800 members. Its scientific activities, in addition to an annual meeting, include publishing the valuable and scholarly periodical surveys, the *Primer on Rheumatic Diseases* and the Rheumatism Reviews of current literature. In a country where almost every professional sect has its journal, there is as yet no purely American specialist journal of rheumatic diseases. There is a notable shyness on the part of American doctors interested in rheumatic diseases to regard this field as a specialty or themselves as other than "internists with a bias." The word rheumatology is even slower at gaining acceptance than in Britain, and moves to organise specialist qualifying examinations in this subject have been strenuously opposed. Although the number of members of the American Rheumatism Association is growing, it is still small compared with the counterpart organisations of other specialties, and there is only 1 member for every 12,000 sufferers from the rheumatic diseases. Comparatively few young doctors enter this field, a fact which McEwen [6] has traced back to the universities, commenting that only about six of these have special rheumatism departments supporting adequate numbers of full-time faculty members. Although the American Arthritis and Rheumatism Foundation offers a number of trainee and research fellowships, the impression I formed in some East Coast medical centres was that at least a quarter of all trainee positions in arthritis are occupied by non-Americans, many of whom will return to their own countries.

Social Aspects

This poor recruitment to the field prompted last year's president of the American Rheumatism Association to propose Federal government support in setting up further university departments of arthritis.[6] Many American doctors are so suspicious of the government in medicine that this would be, in their eyes, a dangerous proposal. The president was, however, only following a well-established trend towards increasing government participation in chronic diseases. Americans are accustomed to see Britain solving problems by "muddling through," but here the rôles are reversed. Inexorably, but in numerous disconnected ways, government agencies supply funds to, and assume some control of, parts of American medical work. The new chain of Veterans' hospitals rivals the ordinary hospital facilities. The Federal government, through the U.S. Public Health Service and other agencies, supplies at least half of all the funds available for medical research at the universities.[7] On a State or city level, authorities provide most of the hospital facilities for tuberculous and mental diseases, as well as the "city" hospitals for the poor or indigent sick, such as the Cook County hospital in Chicago. In some States (Massachusetts is one) State hospitals for the chronic sick are being built. However, the resources of expert arthritis clinics are at present available to only a small minority of patients, partly because of the cost of such clinics and the lack of funds to set up more of them. The American Medical Association has tenaciously clung to the principle that, basically, the patient should pay for his own illness, either from savings or from insurance. In chronic illnesses, which interfere with earning capacity, little money can be got from this source, and any increase of treatment facilities must come either from charity (organised through the Arthritis and Rheumatism Foundation) or from government funds.

To an increasing extent also, government funds are paying the bill for treatment and rehabilitation for the individual patient. The patient without money can always get free treatment (though the quality is very variable) in the city hospitals. In Massachusetts there is a unique scheme in which the State subsidises treatment of the arthritic at private or teaching hospitals. Ex-Servicemen and their families can get free inpatient care at Veterans' hospitals. For those not eligible for this type of aid the situation is ameliorated by the provision of government doles, such as disability assistance or old-age assistance, financed through the Social Security compulsory insurance. (There is more of a Welfare State about America than many Americans would admit.)

1. Cobb, S., Warren, J., Ciocco, A. *Penn. med. J.* 1954, **57**, 37.
2. Woolsey, T. D. *Publ. Hlth Rep., Wash.* 1952, **67**, 505.
3. Kellgren, J. H., Lawrence, J. S., Aitken-Swan, J. *Ann. rheum. Dis.* 1953, **12**, 5.
4. National Health Survey: Sickness and Medical Care Series, bull. no. 6. U.S. Public Health Service, 1939.
5. National Research Council: final report of Committee for Survey on Research on Rheumatic Diseases. Washington, 1949.
6. McEwen, C. *Ann. rheum. Dis.* 1953, **12**, 317.
7. Farmer, D. A. *Harv. med. Alumni Bull.* 1954, **28**, 7.

For the family man who is disabled, there is "Aid to Dependent Children." These in turn may be supplemented by local town or county welfare funds.

Rehabilitation

Most of these money benefits stop when wages are earned; and if the patient then finds that he cannot keep at work, it takes time and trouble to get the benefits started again. Hence a man with several children will think twice before launching himself on the labour market after an illness, and the longer he has been away the harder he finds it to do so. This well-intended system, when not backed up by a programme of retraining whilst on benefit, produces some of the hardest cripples of all to rehabilitate. They are akin to the "compensation cripples" of industry with the difference that they do have a very real self-justification. The handicapped man, maintained in idleness on a Government pittance, is not only a liability to the community but usually not as happy as he might be if he had a job and could feel independent and wanted. As yet it is not very widely appreciated (either in America, or for that matter in England) that it is both humane and sound economics for a disabled man to work part-time, or at a slow rate, even if it costs a subsidy to bring his wages up to full-time equivalence.

In 1943 the Federal government voted to subsidise State vocational rehabilitation services,[8] and many States have taken advantage of this, though to a variable degree. Probably New York and New Jersey offer most for the arthritic, and their welfare services do not require that the patient shall be impoverished before they will aid him. In other States these rehabilitation services have concentrated more on amputees and other injured people, arthritics being considered a less rewarding investment.

Ragan[9] has pointed out that there is still plenty of "work potential" in patients who suffer from rheumatoid arthritis. He found that two-thirds of a representative group of patients (not treated with cortisone) were able to keep at work. The majority of these were doing full-time standing jobs. There was little, if any, correlation between the severity of the disease and the employment records of these patients; so the disease itself was not the only factor that made the other third of these patients unemployed. The Institute of Rehabilitation, associated with the New York University, has, among other things, made a specialty of those gadgets and devices that help to keep the arthritic patient comfortable and independent and if possible at work. Perhaps more significant, is the setting up of the picturesquely named "J.O.B." (Just One Break) Inc., with specialised factory training facilities, as a model of how the factory can be made to fit the man, rather than the man the factory. It is said to have achieved good results even in the severely crippled.[10] This combination of sentiment with sound economics should eventually win considerable support in the U.S.A. and one looks forward to its wider application.

Classification

As well as the primary diseases of joints, the so-called collagen diseases are generally recognised as being within the scope of rheumatology; but ideas on the classification of these diseases are varied. The index of the Tenth Rheumatism Review[11] gives an official interpretation, but in practice two schools of thought are apparent, known colloquially as the "splitters" and the "lumpers." The splitters adopt the classical approach. They believe that by clinical and other observations the family of rheumatism can be divided into genera of diseases, and each genus into individual species. If definitions are sometimes blurred the splitters attribute this to poor observations, and maintain that the foundation of scientific method is differentiation and classification. The lumpers, on the other hand—and theirs is the fashionable view in America at the moment—believe that no good can come from imposing divisions on Nature where none clearly exist: although many syndromes have been differentiated, patients can always be found whose clinical features lie in an intermediate position or show features of more than one syndrome.

This school of thought points out that in some cases the diagnosis between rheumatic fever and rheumatoid arthritis, between rheumatoid arthritis and lupus erythematosus, between lupus and dermatomyositis, and between dermatomyositis and scleroderma, cannot be clearly differentiated either clinically or histologically. In the face of this overlapping of syndromes, Klemperer[12] speaks of the "collagen diseases," Bauer[13] prefers "connective tissue group of diseases," and Selye[14] has sought to include them all under "diseases of adaptation."

However, by a reductio-ad-absurdum argument the splitters are again rising. If it be logical, they say, to include rheumatic fever and polyarteritis in this group, then surely one should include temporal arteritis, serum-sickness, and the Henoch-Schonlein syndrome. If disseminated lupus, why not discoid lupus? If rheumatoid arthritis, why not granuloma annulare? On the fringe, waiting to be invited, are psoriasis, nodular panniculitis, erythema nodosum, Reiter's syndrome, and ulcerative colitis. And if these are admitted, why exclude idiopathic thromboyctopenic purpura, malignant hypertension, acute nephritis, Whipple's disease, iridocyclitis, and a host of skin conditions. By this time, of course, we should have almost a complete list of those diseases whose cause and cure are unknown, and we might as well start again.

These opposing views on classification will both be confounded when more facts on causes are known. Meanwhile it seems best to regard the connective-tissue diseases as a kind of "unlucky dip"* from which each patient pulls out his particular set of symptoms and signs, some combinations being more frequent than others, but all being possible.

Treatment

At a meeting of the New England Orthopedic Society last year, Dr. Charles Ragan and Dr. Walter Bauer were the speakers. Both are rheumatologists of long experience working in hospitals catering for the same type of patients. Ragan,[15] at the Presbyterian Hospital in New York (an undergraduate teaching hospital demanding quick turnover of beds), had for over twenty years followed the policy of "try everything," mostly on an outpatient basis. Bauer,[16] over the same period, worked at a hospital where subsidised beds were available for long-term inpatient care, and had relied mainly on bed rest and aspirin and other simple measures. The long-term results for remission, deformity, or death had been about the same whichever approach had been used.

Experiences such as this provide the setting against which new ideas in therapy are to be assessed. In America, as in the rest of the world, every year produces its crop of new cures for arthritis, and most of them do not need mentioning here. One year's wonder drug (postpartum plasma, for example) has a way of ending in the next *Primer of Rheumatic Diseases* among "treatments of doubtful or unproved value." Phenylbutazone is one exception which has so far won guarded acceptance. American experience has been that this is an effective anti-inflammatory agent, with a considerable risk of drug complications (including several reported deaths).

8. Vocational Rehabilitation Act Amendments of 1943. Publ. Law 113. 78th Congress.
9. Ragan, C. *Industr. Med. Surg.* 1953, **22**, 309.
10. Viscardi, H. *Ibid*, p. 307.
11. Robinson, W. D. et al. *Ann. intern. Med.* 1953, **39**, 497, 758.
12. Klemperer, F. *Amer. J. Path.* 1950, **26**, 505.
13. Bauer, W. *Trans. Coll. Phycns Philad.* 1953, **21**, 39.
14. Selye, H. *J. clin. Endocrin.* 1946, **6**, 111.
15. Ragan, C. *Bull. N.Y. Acad. Med.* 1951, **27**, 63.
16. Short, C. L., Bauer, W. *New Engl. J. Med.* 1948, **238**, 142.

* "Lucky dip" (Eng.) equals "fishpond" (Amer.).

From the Mayo Clinic, four years ago, came the news that a new adrenal hormone had been found to have a startlingly beneficial action in rheumatoid arthritis.[17] Although the limitations of cortisone were later to become apparent, there is no denying the great effect that the discovery has had on rheumatology, nor the renown that has accrued to the clinic. Hence I was distinctly surprised to find that, at its birthplace, cortisone is not looked upon with any great favour. Indeed, one of the problems at the Mayo Clinic is now that of coping with numbers of patients who have been put on this hormone by outside doctors, have run into trouble, and have been sent to the clinic to be straightened out. As a result of such experiences, Slocumb, at the clinic, seldom starts a rheumatoid-arthritis patient on cortisone. He has written of the contra-indications of this treatment, of the safe limits of dosage, and of the various states of disease that long-continued cortisone administration can produce. The tidal wave of enthusiasm which spread out from the Mayo Clinic is now being followed by a trough of caution.

Britain, further from the epicentre, and cut off from direct sources of supply, seems to have arrived at a fair evaluation of the drug more quickly. There are few in American rheumatology who would agree with the view expressed by Foss[18] last year when writing of "fundamental and essential research on cortisone," that "much of this had already been adequately completed on a vastly larger scale in America." The boot is in fact on the other foot. The controlled trial of cortisone in rheumatoid arthritis, such as that conducted by the Medical Research Council[19] last year, has attracted interest but has so far not been attempted in the U.S.A. Profusion rather than precision has characterised American use of this hormone. Despite four years of intensive experience of this drug in America, it would be impossible to write down precise conditions for its use in rheumatoid arthritis. Some patients undoubtedly do well on it, but there is as yet no way of telling that they would not have done equally well on aspirin. However, current American experience indicates that cortisone may find its most specific indication in tipping the balance toward employability of those whose disease, but for cortisone, would be too severe or too painful to allow them to work.

Intra-articular hydrocortisone[20] is an example of a different approach to hormone treatment. This method is quick, easy, undoubtedly "works," and is widely used in many conditions. Its danger is that the busy practitioner will rely on it at the expense of more fundamental measures. At one clinic specialising in this treatment (an isolated instance) it was possible to see a succession of fat women come in for the weekly injections for their painful knees without more than casual advice being given to them about weight reduction.

Basic Research

In writing on arthritis research in America it is tempting to confine the story to research directly linked with the problems of joint disease; but to do so would be to give a wrong impression. Probably half of the endeavour of research establishments connected with arthritis is concerned with fundamental studies on the biology of connective tissue and other tissues. The reasons for this are not hard to find. They represent American realisation that the classical clinical and histopathological investigations in the connective-tissue diseases have failed (except, perhaps, in the case of rheumatic fever) to lead us to cause, to cure, or to prevention. Many observations have been made by these methods on abnormal features found in the rheumatic diseases, but further understanding of their significance is blocked because not enough is known of the normal. The cry is now, so to speak, "Back to the Labs!," and an arthritis research institution is hardly considered complete without its protein chemists, polysaccharide chemists, biologists, and enzymologists. Some also have physicists and statisticians. Gone are the days when clinical observation, pharmacological invention, morbid anatomy, and histology sufficed.

This is a trend that has come in only slowly. In America medical research is financed by a multitude of funds—some rich, some poor, some widely available, some limited to certain institutions. Most of these funds can be described as partisan: their money is allotted on an annual basis for research in a particular disease. A research-worker bidding for financial support therefore prepares a project which he attempts to fit to the interests of the fund he is approaching. An economic factor is thus at work in "project" research which constantly pushes investigations towards the diseased state and away from fundamental studies on the normal. In rheumatology, as long as no cure for rheumatoid arthritis is forthcoming, this is a practice which cannot be said to have paid, and institutions which give money (including several of the agencies under the U.S. Public Health Service) are increasingly aware both that basic research must be actively cherished and also that it pays to support the research-worker, letting him go wherever his problem takes him, rather than attempt to limit him to a preconceived project. In line with this, the Arthritis and Rheumatism Foundation has recently established a number of five-year senior research fellowships offering established research-workers security of support. They are thus not under constant pressure to publish results and to justify themselves, but can tackle the obscure or difficult problems which offer little hope of quick returns. It is interesting to note how Americans are following Medical Research Council practice in this policy of supporting the person rather than the project.

By definition, of course, basic research is not limited in its significance to only one disease. Its implication may be felt in many fields, and much work of possible meaning to the connective-tissue disorders is associated with groups working under quite different auspices. In arthritis laboratories, however, it is usually assumed that the connective tissues hold the key to further advance. The non-cellular constituents of connective tissues are fairly well defined by now—i.e., collagen and elastic fibres, and polysaccharide-containing ground substance. Hence one finds that "arthritis" basic research in America is divided into studies on the sugars and protein of ground substance, on the chemistry and biology of fibres, or on the various enzymes and hormones that can affect those materials.

Some examples will illustrate this reorientation of research.

Hyaluronic acid, the complex sugar found in joint fluid, has long been known to be altered in rheumatoid arthritis. The significance of this is not apparent, because the mechanism governing the normal synthesis and breakdown of this material is unknown. Recently Roseman[21] working in Chicago, has been able to label six-carbon sugars with radioactive tracers and has shown that glucose, for example, can be made directly into the hyaluronic acid molecule without prior degradation to three-carbon units as had previously been thought necessary. The enzymes that can effect this conversion, and through what intermediates, remain mysteries. Such studies are of obvious importance and Roseman has recently moved to the gracious little university town of Ann Arbor, where a large new arthritis research laboratory is being set up in connection with the university hospital.

Schubert, at the Rheumatic Diseases Study Group at New York University, has sought to define more clearly the factors which influence tissue polysaccharide metachromasia in the

17. Hench, P. S., Kendall, E. C., Slocumb, C. H., Polley, H. F. *Proc. Mayo Clin.* 1949, **24**, 181.
18. Foss, G. L. *Lancet*, *1953*, *ii*, *1319*.
19. Kellgren, J. H., Hill, A. B. *Ann. rheum. Dis.* 1953, **12**, 327.
20. Hollander, J. L. *Ann. intern. Med.* 1953, **39**, 735.
21. Roseman, S., Moses. F. E., Ludoweig, J., Dorfman, A. *J. biol. Chem.* 1953, **203**, 213.

test-tube, so that valid inferences may be made as to the state of these materials in the body.[22]

Boas, at the Institute of Arthritis and Metabolic Diseases, has improved methods of estimating aminosugars in body tissues.[23]

Meyer, at Columbia University, who more than most is responsible for opening up this field with his synovial fluid hyaluronic-acid investigations, continues his studies on the structures of these materials.

Jeanloz, at the arthritis department of the Massachusetts General Hospital, has attacked these structure problems in a comprehensive series of substituted sugars and aminosugars used as reference compounds for identifying the breakdown products of the naturally occurring carbohydrates.

In the same hospital Gross [24] has initiated a study of fibrogenesis in the test-tube. Mildly alkaline solutions extract from connective tissues a soluble form of collagen from which, without the intervention of enzymes or hormones, fibres apparently identical with naturally occurring white fibres can be irreversibly precipitated. Here, then, is a working model from which Gross hopes to learn what might cause or inhibit the formation of fibres in the extracellular spaces of the body—factors which bear directly on many problems of scarring, repair, and contracture, of importance in the rheumatic diseases.

Wyckoff, at the Institute of Arthritis, has worked along similar lines.[25] The group at New York University are also working on problems of collagen, by means of its characteristic amino-acid, hydroxyproline.

Specific Diseases

Apart from basic research, a good deal of investigation is going on in the problems of specific diseases. It would be impossible to describe here all the ways in which these problems are being approached in the United States, but one can try for each disorder to pick out one approach that seems to offer the most promise for the future. Spotting the winners is notoriously fallible, even for such simple things as race-horses, and the only excuse for doing so here must be that it will make it interesting to look back in ten years' time and see how things worked out.

The salient fact about *rheumatic fever* is that it is the only member of the group of connective-tissue diseases where a sine-qua-non cause is known. The relation of respiratory streptococcal infections to subsequent rheumatic fever is now well established, and, thanks to the propaganda of the American Heart Association, chemoprophylaxis of rheumatic fever is now so widely accepted in the United States that many would consider it almost unethical not to give rheumatic children daily antibiotics. The question has become, when to stop?

Obviously such prophylaxis, troublesome and not always effective, is only a second best compared with the active immunisation which is possible for other microbial infections such as diphtheria. Immunisation against streptococci, if it ever became practicable, would mark the next great step in the prevention of rheumatic fever and rheumatic heart-disease. At first sight it seems to be a tough problem. There are at least 40 different types of group A β-hæmolytic streptococci. Experts have stated, however, that immunity to one type once developed is long lasting.[26] Here, then, is a possible line of attack. If all type-characteristic "M" proteins of streptococci could be obtained, perhaps they could be combined as one grand cocktail for immunisation. Bacteriologists would be needed to grow large amounts of true-to-type organisms, protein chemists to extract and purify the "M" proteins, immunologists to work out ways of detoxicating the proteins without losing the power to confer immunity, clinicians and statisticians to observe and assess the results. Can this be done? The success of the immunological onslaught on the poliomyelitis virus encourages many to believe that something similar may be possible for streptococcal diseases and their sequels. Certainly, the great advances made in recent years by protein chemists in methods of purifying proteins without destroying them invite a reopening of this old question.

In *rheumatoid arthritis* there is as yet no such clear evidence of a cause. Nevertheless there *is* evidence of a specific immunological reaction to some unknown antigen in the differential sheep-cell agglutination and the streptococcal agglutination tests. This reaction is one of the few manifestations of adult peripheral rheumatoid arthritis which is not shared to any substantial extent with the other connective-tissue diseases. False positives are uncommon and specificity is high (80–90%) if only those patients with subcutaneous nodules are considered. The serum factor responsible for these reactions has attracted the attention of several American workers who hope to isolate and purify it, and at last year's American Rheumatism Association meeting,[27–30] several speakers gave preliminary data. So far no clear idea of a chemical nature of this factor has emerged other than that it is a protein associated with the γ-globulins. There seems no doubt, however, that it will soon be isolated, judging by the success that has attended previous efforts to isolate other blood components such as prothrombin.

The most interesting contribution of American research to *gout* is undoubtedly the use of heavy-isotope-labelled nitrogenous compounds related to purine metabolism—tracing them by means of the mass-spectrograph. No radiation hazards are involved and prolonged or repeated experiments are possible. This is a technique with countless ways of being used. It is expensive and requires highly specialised apparatus, but it has already yielded important information, such as the exploding of the old idea that exogenous uric acid is derived solely from nucleoproteins present in food.[31] A great deal is known about the normal precursors and metabolism of uric acid, and with the new tool it should be possible to find out at what stage this normal metabolism breaks down in gouty subjects.

Most American rheumatologists accept that *primary degenerative joint disease* is essentially a wearing-out process where attrition of joint cartilage has exceeded whatever regenerative power it has. In contrast, the articular cartilage of patients with acromegaly is thickened and shows histological evidence of an increased rate of chondrocyte multiplication. The possibility that growth hormone might be used therapeutically to heal eroding joint cartilage has attracted attention.[32] Recent progress in the preparation and purification of growth hormone has enabled some preliminary animal experiments to be done using intra-articular injection. At present all that can be said is that the method looks promising, and is about the only positive lead we have in the study of this stubborn disease—unless of course something comes of the study of those lucky people who live to old age without osteo-arthritis.

Facilities

The British visitor to America never fails to be impressed by the quantity and expense of the equipment available for research. If it is going to take intricate machines to crack the nut of arthritis, then the Americans have a long start on the British. Large new research

22. Hamerman, D. J., Schubert, M. *J. gen. Physiol.* 1953, **37**, 291.
23. Boas, N. F. *J. biol. Chem.* 1953, **204**, 553.
24. Gross, J., Highberger, J. H., Schmitt, F. O. *Proc. Soc. exp. Biol., N.Y.* 1952, **80**, 462.
25. Wyckoff, R. W. G. *In* Connective Tissues (Transactions of the Third Conference, Josiah Macy, Jr., Foundation). New York, 1952.
26. Dingle, J. H., Rammelkamp, C. H., Wannamaker, L. W. *Lancet*, 1953, i, 736.
27. Jacobson, A. S., Kammerer, W. H., Kolodny, M. H., Heller, G. *Ann. rheum. Dis.* 1953, **12**, 321.
28. Coggleshall, H. C. *Ibid.*
29. Bayles, T. B. *Ibid*, p. 322.
30. Bunim, J. J. *Ibid.*
31. Benedict, J. D., Roch, M., Yu, T. F., Bien, E. J., Gutman, A. B., Stettin, DeW. jun. *Metabolism*, 1952, **1**, 3.
32. Waine, H., Westermeyer, V. W. *Ann. rheum. Dis.* 1952, **11**, 295.

institutions are being built and equipped, of which the Institute of Arthritis and Metabolic Diseases at Bethesda and the Kresge Research Building at Ann Arbor are two recent examples. Somewhere near the entrance of almost every American teaching hospital there is a large architect's model illustrating a development plan, in which extensions of research facilities are a major feature.

A modern American research building is almost as packed with equipment as a warship. Innumerable pipes and wires traverse in all directions, with ten or more utilities piped to every bench. Electronic equipment is everywhere and there is an increasing tendency to use fully automatic recorders—i.e., those machines where one puts in one's chemical compound (or one's patient) and pulls out a ready-made graph with the answer. There are probably as many electron microscopes in Boston alone as there are in the whole of England, whilst the application of radioactive tracer techniques is now commonplace. Americans even sometimes feel that they are slaves to their machines and look with envy at such work as that of Day [33] which has yielded important information on connective-tissue problems at the cost of a few mice and a short length of glass tubing. It would be wrong, of course, to give the impression that simple yet penetrating observations on connective tissue are limited to the Eastern side of the Atlantic. The work of Paul Weiss, the University of Chicago embryologist, on the way in which the physical condition of the connective tissue can profoundly influence cell growth within it, proves very much to the contrary. Nor should one belittle the use of expensive equipment much of which can take tedious man-hours out of research, or do jobs not possible in any other way. It is good to be reminded, however, that these glamorous machines are but new tools, and what they produce depends on who uses them.

33. Day, T. D. *J. Physiol.* 1952, **117**, 1.

Conclusion

In the United States increasing realisation of the social importance of the rheumatic diseases is leading to increased research, particularly into chronic arthritis and problems of basic physiology. Of course, these trends are not peculiar to the rheumatic disorders: similar ones are apparent for other chronic diseases for which there is as yet no prevention or cure. For that matter, many of these trends are not peculiar to the United States, and much of what has been commented on could be said of Britain with equal aptness. What makes the problem of arthritis in the United States outstanding is its numerical size and the energy and diversity of the ways it is being attacked.

This article is one outcome of eighteen months spent working in one American hospital, and visiting others. Throughout this time I never ceased to be impressed by the courtesy and hospitality of American physicians. Busy people would sometimes spend hours discussing their work and showing their laboratories and clinics. To them I should like to express my grateful appreciation.

Medical Conferences

STUDENTS' INTERNATIONAL CONFERENCE

FROM A CORRESPONDENT

THE Students' International Clinical Conference, which ended in Edinburgh last week, was attended by students from countries as far apart as Sweden and South Africa, representing in all some 22 nationalities. The conference was organised by the British Medical Students' Association, under the auspices of the International Federation of Medical Students' Associations. (The Federation was formed some three years ago in an attempt to establish an international medical-student body to promote medical-student interests, mainly through visits and exchanges in an atmosphere entirely free from political bias; and the B.M.S.A. acted as the first chairman nation, in the name of Great Britain.) Sir Cecil Wakeley, president-elect of the B.M.S.A., took the chair at the opening session of the conference in London on July 15, when Miss Patricia Hornsby-Smith, parliamentary secretary to the Ministry of Health, welcomed delegates on the Government's behalf.

For their first week the delegates stayed in London, spending most of their time at the teaching hospitals, where they heard some of London's most prominent teachers and clinicians. They heard special lectures on advanced subjects, and saw something of teaching methods in this country, which often differed widely from their own. At St. George's Hospital, for example, delegates attended normal teaching clinics and ward rounds, and at the London Hospital they were able to take part in the discussions at one of the clinicopathological conferences. On the Sunday the visitors went to Cambridge, where the entertainment provided by members of the Medical Society included tea in an undergraduate's rooms, with a traditional and immense dish of strawberries and cream. On the last night in London, *The Practitioner* gave a reception, and later there was an informal dinner. The first section of the programme ended next morning with an address by Dr. W. N. Pickles, president of the College of General Practitioners, and a tour of the Royal College of Surgeons conducted by Sir Cecil Wakeley.

For the next three days the scene shifted to Birmingham. Among a splendid variety of lectures and demonstrations, delegates were particularly interested to see the Birmingham Accident Hospital and the Sorrento Premature Unit, where Dr. Mary Crosse conducted a lively discussion. The hostels in which the visitors stayed in Birmingham were magnificent, but the entertainment offered was so lavish that they had little time to relax in their pleasant surroundings. Birmingham's parting gift was a visit to a performance of *Troilus and Cressida* at the Memorial Theatre, Stratford on Avon: one of the finest nights of the tour contributed to a memorable evening.

Next morning delegates made an early start by coach for Edinburgh, and, despite pouring rain and protesting drivers, the route was extended to include the Lake District, where the sun won through sufficiently to allow a picnic on the shores of Derwentwater. By sunset the Pentlands were in sight, and the conference came presently to Edinburgh, having in ten days seen more of Britain than many Britons and more of its medicine than many of its students.

With only four days left, a different atmosphere prevailed, and happily there was a different programme, which allowed more time for visits to the city. This is not to say that clinics were less well attended or discussion less intense, but delegates seemed to feel that they must make the most of what time was left. An event that was particularly enjoyed was the visit one evening, in groups of three or four, to general practitioners about the city. The doctors, with their families, provided genial hospitality ranging from a quiet evening's talk to Highland dancing and songs. To round off a busy programme, the conservator of the Royal College of Surgeons of Edinburgh arranged a visit to the college.

What did the conference achieve? Thanks to the willing coöperation of deans and teachers, the work of student organisers in the three centres, and the generosity of those who gave financial support, delegates were introduced to many of this country's leading clinicians and heard much about their work—both clinical and research. They also learned how all this compared with such things in other countries. They saw something of

our style of teaching and of our teaching schools. They saw, if briefly, something of this country and we hope they are all keen to come again. Above all, students from many countries were able to meet on their common ground of medicine; and international friendships sprang up at a time when they can be of particular help. Conferences such as this (and one is held each year in a different country) may give students a taste for travel which will stay with them throughout their careers—a taste that would benefit not only the cause of medicine but also that of international understanding and goodwill.

Medicine and the Law

Operation for Sterilisation

IF a man undergoes an operation for sterilisation, does that amount to cruelty to his wife? This question was considered by the Court of Appeal in Bravery *v.* Bravery,[1] when the wife appealed against the rejection of a divorce petition in which she alleged cruelty. The Master of the Rolls and Lord Justice Hodson were in favour of dismissing her appeal, but Lord Justice Denning would have allowed it. There was, however, a certain amount in common between the conflicting judgments, and one should not read into the majority judgment more than was actually said.

The parties were married in 1934, and a child was born in 1936. In 1938 the husband, a hospital porter, underwent an operation for sterilisation at the hospital at which he was employed. In 1951 the wife left the husband.

The Master of the Rolls and Lord Justice Hodson said that for a man to submit himself to such an operation without good medical reason would no doubt, unless the wife were a consenting party, be a grave offence to her which could without difficulty be shown to have been a cruel act if it were found to have injured her health. But such was never the case put forward by the wife. The operation took a minor place among her complaints. Their Lordships found it impossible to conclude that she had ever made any effective objection to the operation being performed. She was living in the hospital and had ample opportunity of objecting if she were not a consenting party. They found it difficult to believe that a surgeon would perform an operation of this kind on a young married man unless he was satisfied that the wife consented.

Lord Justice Denning said that in his view the husband was jealous of the child of the marriage and was determined not to give his wife any more children because he thought she made too much of her baby. To pay her out in this way was cruelty, an act disruptive of the married state. She had not objected as effectively as she might have done, but it was not for her to approach the surgeon: it was for the surgeon to approach her. On the evidence the proper inference was that she did not consent. There was no just cause or excuse for this operation. Such an operation had an effect which continued throughout the marriage, and even if the wife did consent at the time, that did not preclude her from complaining of its ill effects in later years when it did in fact injure her health.

Lord Justice Denning went on to make some general observations which are likely to raise considerable controversy. When a sterilisation operation was done with a man's consent for a just cause, it was quite lawful, as when done to prevent the transmission of a hereditary disease. But when it was done without just cause or excuse, it was unlawful even though the man consented to it. Where, for instance, a sterilisation operation was done so as to enable a man to have the pleasure of sexual intercourse without shouldering the responsibilities attaching to it, it was plainly injurious to the public interest. It was degrading to the man himself. It was injurious to his wife and to any woman he might marry; and, unlike contraceptives, it allowed no room for a change of mind. The divorce courts should not countenance an operation for sterilisation without just cause or excuse any more than the criminal courts.

The Master of the Rolls and Lord Justice Hodson dissociated themselves from Lord Justice Denning's view that, in the absence of some "just cause or excuse," an operation for sterilisation is an unlawful assault, an act criminal in itself to which consent provides no answer or plea. They observed that the general question whether an operation for sterilisation is prima-facie illegal, and the particular question whether this operation was a criminal assault could not in this case be irrelevant to the issue to be determined. It is to be observed, however, that their Lordships said nothing to justify such operations, and the issue raised by Lord Justice Denning cannot be regarded as settled. The wife's petition was dismissed in consequence of the majority decision. As leave to appeal to the House of Lords was refused, we shall have no chance to know if Lord Justice Denning was right after all. For the present, it seems, we must believe he was wrong.

1. *Times*, July 27, 1954.

Divorce: Plea of Mental Illness

In Gore-Booth *v.* Gore-Booth,[2] Mr. Justice Collingwood had occasion to consider a plea of mental illness as a defence in divorce proceedings. The wife had already obtained a decree on the ground of her husband's cruelty, but a rehearing was ordered because the husband had been personally served with the petition while he was of unsound mind. The Official Solicitor was appointed as guardian *ad litem* for the purpose of the rehearing; he denied cruelty, pleaded condonation, and alleged that if there had been uncondoned cruelty the husband did not know the nature and quality of his acts, or that they were wrong, and that he was not responsible for such acts.

The parties had married in August, 1948, and children were born to them in 1949 and 1950. They finally separated in August, 1951, and from September of that year to June, 1952, the husband had been a patient in certain Irish hospitals where he had undergone mental and convalescent treatment.

On the issue of cruelty, Mr. Justice Collingwood said that before the first child was born the husband had insisted that the wife's mother was not to be told of the confinement, saying that he feared that it would lead to interference, and he did all he could to prevent her seeing his people unless he himself were present. His behaviour at the birth of the second child was outrageous—he locked the room where she was and resented anyone seeing her. His conduct amounted in law to cruelty. Although the wife had realised that her husband was not normal, the judge did not think that she realised the true nature of his mental illness. Some of the allegations were serious in themselves, and she had been terrified and upset by his behaviour on a number of occasions. There had been no condonation.

Dealing with the defence of mental illness, the judge said that it was clear that the husband had been of unsound mind, suffering from schizophrenia, at the end of 1951, although since June, 1952, he had not been under control of any kind. Evidence had been given that many schizophrenics knew what they were doing, and that many did not have to be controlled. The husband had on many occasions of alleged acts of cruelty apologised afterwards, dried his wife's tears, and made it up. The evidence showed that the husband knew that it was wrong to occasion harm to his wife and to distress her. His behaviour had been consistent with his knowing what he was doing, and knowing that it was wrong.

2. *Ibid.*

In England Now

A Running Commentary by Peripatetic Correspondents

IN one of our wild moments recently we cast aside our Scottish caution and bought ourselves a new fitted bedroom carpet. Yesterday they sent Fred to lay it. There are few houses in the district to which Fred has not been called at one time or another, for he is seventy, and he has been fitting carpets since he was fourteen. He knows us well. "Hae ye sellt yer auld pink een?" he shouted as soon as he got inside. "Yes!" we yelled back into the formidable amplifier Fred keeps strapped round his middle to maintain his liaison with the outside world. He nodded agreement. "It was sair tashed," he roared. We did not venture further conversation, for Fred is fond of a pint, and we intended to stand him one when he had finished; our breath would be needed later. We led him up to inspect our prize. "Ay, well," he said consideringly, in tones that shook the plaster, "she's no a bad carpet!" (Carpets, like ships, are always feminine). We left him to it, and for an hour or so we could hear him bumping around upstairs and clearing his throat with a menacing growl at intervals. Fred works on a sort of echo-sounding principle; whenever he approaches a wall he clears his throat and the resulting concussion tells him how far he still has to go.

When he had finished we took him down the road to the pub, and he told us the news of the day over his pint. It had been a bad one. First he had had a carpet that had been pieced together upside down, so that he had had to go back to the shop and get the lassie to come back with him and take the whole thing to bits and start again. Then he had spent the early part of the afternoon fitting lino in the bathroom of some friends of ours. Fitting lino always renders Fred expansive and he was soon demonstrating on the table with his pint and his pipe. "Here's the bath here, Doctor, and thonder's the pan," he thundered, to the interest of the assembled company, "but I'm no needin' tae tell ye Doctor, ye ken it fine yerself! Twa hoors I wrocht wi' her!" (Bathrooms, like carpets, are always feminine.) To change the subject we screamed an inquiry after his health into the microphone. Fred lowered his voice to a confidential shout. "It's the screws, Doctor, I get them steady." Several bystanders nodded understandingly, and murmured sympathetically among themselves. A little knot of people at the far end of the room came closer.

At this point we were unfortunately called to the telephone, and missed the ensuing pathological revelations. When we came back Fred was ready to go home, and the matter had evidently been thoroughly thrashed out. Never mind, we shall get the details when our dining-room carpet comes back from cleaning.

* * *

Scientists who fail to attend the Bond Street sale-rooms don't know what they are missing. In my catalogue I find listed under Scientific Instruments a "portable microscope in a fitted fish skin case" (useful for the travelling marine biologist), an "improved Chondrometer in mahogany case" (for testing, perhaps, the flexibility of the costal cartilages in the gerontological unit), and two folding guinea scales (consultants who are constantly being paid in lead guineas would find these invaluable), and a French brass folding-rule engraved with scales for measuring Solids and Calibres (surely a valuable dual instrument for measuring marbles in bronchi and beads in urethras, which would fit easily into the handkerchief pocket). I confess I cannot readily think of a use for a compass sundial in silver, the hinged gnomon chased with a bird, a sinical quadrant, and a celestial globe on ebonised plinth—save perhaps to remind us of the elegance and refinement of bygone laboratories.

* * *

How differently the lawyers behave from us. At our local medical society dinner we always try to get an outsider to be our guest of honour because, as Lord Simon once said, "other people's shop is always interesting." Not so the lawyers. At a legal dinner which I enjoyed last week the speeches were all by bench, bar, or solicitor. They were arranged admirably, a dull one followed by a good one, and the mixture being repeated thrice *post cibum*. Two themes ran through them—the unswerving justice of the law, and that fees were not really commensurate with services rendered. The second led to several references to the Danckwerts award and how solicitors would like similar treatment. No-one pointed out that this was just another example of British justice.

Would lawyers really like to be on sessions, I wondered. Speeches might be lengthened and add considerably to the law's delay, and I cannot imagine a solicitor called out on a domiciliary visit to settle a domestic quarrel calling in a barrister for counsel's opinion. Lawyers will certainly see to it that they are never nationalised, and they will have the country behind them. They are supreme as they are. But how I wish they could have an appointment system!

A few years ago I was summoned as a witness on behalf of a girl who had lost her finger through negligence of her employers: I arrived at the assize court at 10 A.M. and was told that the case would not come on during the morning; and I received similar messages until 4.30 P.M. when I was told the case had been settled out of court. My day would have been wasted if there had not been an interesting calendar in the criminal division, sitting alongside the civil division. I always quote this day to those people who tell me that the outpatient appointment system is not working very well.

* * *

I sailed away from Manager-Krankheit and measles, placenta prævia and polio; sailed away for a whole afternoon down to the far end of the lake. Nine miles of silent waterway threading between the green-clad slopes, each reach unfolding a changing pattern of light and shade on the fells, each little valley tumbling a cascade of water, and a puff of wind to make me lift the helm as we heel to the playful jest.

Yet the silence is only comparative. Gone are the chattering voices, the bells and bangs of dry land. The gentler sounds sigh and soothe out here. The ripple of wavelets under the bow, the tremor along the planking, the faint hum of the rigging, and the occasional creak of a block, carry me out of this landlocked world into the fantasies of sky and sea. If I can never unravel the closehauled mysteries of movement to windward—the resultants and the metacentres—who cares? I shall remember the sweeping parabola of the masthead against the cumulus, the dancing lift of the prow, and the white spray washing over the side—the cares of the day swirling away in the bubbles of our wake.

But the shadowy ghost of Medicine will not be banished from my crew. Helmsman and craft against Nature; doctor and patient against Nature? What presumption! With Nature, not against her, is the creed for mortals. The feel of the helm to the thrust of white canvas; the feel of steel forceps to the uterine wave. The surge and flurry of coming about; the climax of live birth delivery; the smack and upset of a gybe; the shock of a P.P.H. But Nature is kind this long summer afternoon to lend me the mastery of white wings on the lake. May she keep so-minded and give me the peace of the harbour at the end of the day.

* * *

Let us not in the matter of Chest Pain
Be led astray. Thus an Ischæmic Heart
May leave the patient seeming right as rain
Next day; but far more likely in the Cart.
Once having made the diagnosis, stick
Fast to it, refusing to be shaken
Into belief that all was merely Gastric
Whether or not the E.C.G. was taken;
For in the next brief ambulatory hours
The blanchèd Muscle fatally may burst
And usher grief and melancholy flowers
Into the household wholly unrehearsed.
Still less the error, if we Count the White
And mark the B.P. and the Fahrenheit.

* * *

Overheard at Queen Square.
Bill: "What is a Censor?"
Henry: "A Censor is a sort of monster, half man, half beast."

Letters to the Editor

LUMBAR PUNCTURE IN POLIOMYELITIS

SIR,—I read with some concern that it is the practice in Southend to perform lumbar puncture on non-paralytic as well as paralytic cases of poliomyelitis (June 19, p. 1291).

I am very uneasy about the desirability of this procedure in the acute stage; and I am not sure that the natural course of the disease is not altered for the worse. In my experience absence of pleocytosis does not mean absence of the disease. I saw a patient whose cerebrospinal fluid contained less than 1 cell per c.mm. on the day after the onset of facial palsy; the paralysis spread the next day and he died in the respirator 3 days later.

I feel that, where C.S.F. examination is not required to eliminate such possibilities as meningitis, it should not be performed. As far as the individual patient is concerned, it is of no benefit to him. In paralytic cases it is of no advantage to have confirmatory evidence immediately; in a day or so, it may be all too obvious what is wrong. In non-paralytic cases the patient's comfort should be more important than the epidemiologist's evidence.

British Military Hospital,
Cyprus. DAVID HAMILTON.

SASKATCHEWAN AND SHEFFIELD

SIR,—Your leader of July 3 makes an interesting comparison between Saskatchewan and Sheffield, and I would like to comment on this, and add to it. Your explanation of the difference is partly correct. Saskatchewan people have paid for their hospitals, and they expect to use them to the fullest advantage. All obstetric cases, and many conditions which would be treated in the home in Britain, are dealt with in hospital, because distances are great and the roads are bad. For about four months in the year, these are as good as Britain's farm tracks. The rest of the time they are covered with snow or are a series of mud holes; cars are pulled out by horses or tractors every few miles, and a short journey may take half a day.

Hospitals are far from cheap here. In the few cities, there are big hospitals comparable in every way with the best in Britain. The great bulk of hospital beds are in hospitals of 10–20 beds in small country towns, run by one or two general practitioners, who are pathologist, radiologist, surgeon, anæsthetist, obstetrician, and everything else that may be needed, and consequently the amount of equipment throughout the province is much greater than for a similar number of beds in Britain. Building is expensive, and manufactured articles are dear because of freight rates and duty. Also, most of the buildings are new, and there has been considerable capital outlay on this account. Nurses work an eight-hour shift, and are paid $200 per month; and the smallest hospital requires three nurses to be staffed properly, so expenses are high. Against this background, Saskatchewan's achievement is all the more remarkable, and Britain's lack of progress makes very sorry reading.

The cost of comprehensive medical care compares well with the cost in Britain. Hospitalisation costs $16 per head annually, and outpatient and medical care, through a non-profit-making organisation, costs about $20 with a reduced family rate. There is also a small grant from provincial funds to assist in hospital finance. We do not have an ambulance service, apart from the air ambulance to the cities, nor do we have an elaborate public-health service, but in many ways the service is better than in Britain. Doctors are better off financially, and the cost to the individual compares well with the cost per head of the National Health Service.

The Saskatchewan government has taken risks to improve the medical services available. For many years the province was poverty-stricken, and it is not financially stable in view of its dependence on the grain crop, which can fail for so many reasons, so that the long-term planning such as is needed in financing a medical-care scheme needs considerable ability. Both Britain and Saskatchewan have had, and still have, many problems to face, and whereas Saskatchewan has achieved a lot, Britain has made little if any progress. The technical details may be different, but fundamentally the care and treatment of the sick requires time, thought, and money in both places, and there can be no justification for complacency about long waiting-lists and the shortage of beds. Housing and school building may have priority, but the building of new hospitals in Britain must come soon, if the National Health Service is not to degenerate into the worst form of charity service, to the disadvantage and discredit of everybody.

Wawota, Saskatchewan. P. W. HOPPER.

POSTOPERATIVE PAIN

SIR,—We were greatly interested in Mr. Rowlandson's account, in your issue of July 24, of his attempted control of postoperative pain in thoracic surgery. Over the last two years we have been engaged in a similar study with a number of local anæsthetic drugs. Amongst the substances investigated was 'Efocaine.'

We do not now use efocaine for prolonged local anæsthesia by intercostal block: firstly, because of the dangers associated with its inadvertent intrathecal injection, in which, however, recovery has been known to take place; secondly, because vascular accidents to the cord may occur as a result of its injection into the intercostal vessels. Our records show, however, that efocaine was effective in alleviating postoperative pain for from four days to a fortnight.

In view of the variability of the intensity of postoperative pain from one patient to another, as was shown by Papper et al.,[1] we used efocaine on 26 patients who underwent multiple thoracic operations; they therefore acted as their own controls. Of these 26 patients, 20 noted a definite diminution in their postoperative pain when efocaine was used, 2 complained of increased pain, and 4 were uncertain and were regarded as failures. One observer was used, and patients were not aware in which operation efocaine was used.

In a series of 110 thoracic operations substantial relief from pain was achieved in 89 cases, and 21 were failures. Of the 89 successes 76 had two or less injections of 'Omnopon' postoperatively.

The possible cause for failure in the series reported by Mr. Rowlandson may be that 3 ml. of efocaine was injected intercostally. Bartlett and Eastwood[2] have shown that 3 ml. of intercostal efocaine invariably produces long-continued pain, whereas with the injection of up to 1·5 ml. they seldom observed postoperative pain. We feel that the principle of intercepting pain impulses regionally by the use of "safe" local anæsthetics is more rational than by using drugs which cause central depression and interfere with the cough threshold. We have had some measure of success in blunting postoperative pain for a period of up to 40 hours by the use of solutions no more toxic than those used in surgery generally. We are searching for a substance or substances that will produce safe sensory loss on injection for from three to five days without causing nerve degeneration and other tissue damage.

Clare Hall Hospital,
Barnet. R. LAIRD
J. D. ROCHFORD.

SIR,—I am grateful to Mr. Rowlandson for his article on postoperative pain and its lack of control by efocaine. I used this material routinely for about 50

1. Papper, E. M., Brodie, B. B., Rovenstine, E. A. *Surgery*, 1952 **32**, 107.
2. Bartlett, R. W., Eastwood, D. W. *Ibid*, p. 956.

consecutive cases and came to the same conclusion—namely, that no relief of pain followed its injection. These conclusions were based entirely on the amount of postoperative drugs used and the nursing staff's assessment of the degree of postoperative pain.

Wolverhampton. E. G. DOLTON.

INTRAVENOUS PETHIDINE FOR HICCUP

SIR,—Some recent experiences of mine suggest that pethidine may be a useful remedy for hiccup. Hiccup is due to an intermittent spasm of the diaphragm with a sudden closure of the glottis,[1] caused by stimulation of the sensory nerve-endings of the phrenic nerve or by stimulation via the vagus nerve. (The phrenic nerve contains both motor and sensory fibres and also sympathetic fibres connected with the cœliac and other intra-abdominal autonomic plexuses.) Central stimulation of the medulla—e.g., in alcoholic intoxication, encephalitis, or uræmia—is also thought to be a cause. Theoretically, pethidine should be of value, because it produces a "spasmolytic or atropine-like action"[2]—i.e., it partly blocks the vagus. Its central depressant action will help by resting a patient fatigued by constant hiccupping.

In the cases here reported, intravenous pethidine was given in a single dose of 50 mg. To ensure success, it must be given intravenously. If 50 mg. is not enough, another 25 mg. may be given. The initial dose of 50 mg. may be repeated within one hour if the hiccup returns, but it should not be repeated a second time for at least three hours.

CASE 1.—Hiccupping began at the start of an operation for gastric ulcer in a man, aged 40. Anæsthesia had been induced with thiopentone and curare. Endotracheal intubation was performed and anæsthesia maintained with closed-circuit ether, nitrous oxide, and oxygen, and curare. In order to overcome hiccupping carbon dioxide was given, but without success. The anæsthesia was then deepened with ether because it was noticed that whenever the surgeon pulled on the stomach the hiccupping became worse, but this did not help. More curare was given, but again with no result. Then it was decided to change the anæsthesia from ether and to give pethidine intravenously, so the depth of anæsthesia was first lightened. 50 mg. of pethidine was then given intravenously, and within two minutes the hiccup stopped and did not recur during the rest of the operation. Anæsthesia was then maintained with pethidine, nitrous oxide, and curare. The operation was completed uneventfully. Five days later the patient had abdominal pain and a recurrence of severe hiccupping, which did not respond to any of the usual treatments. I was asked to see the patient after he had been hiccupping for three days; 50 mg. of pethidine was given intravenously, and within two minutes the hiccup stopped and did not recur.

CASE 2.—During anæsthesia for appendicectomy, in a man aged 28, where ether was given, hiccupping developed. 50 mg. of pethidine was given intravenously and the hiccupping immediately stopped and did not return.

CASE 3.—A man, aged 23, had persistent hiccup for twenty-four hours following obstruction of a colostomy performed three days earlier. Thirteen days before this he was operated on for a perforated bowel after a gunshot wound. 50 mg. of pethidine intravenously stopped the hiccup immediately, but it returned about an hour later. Another 50 mg. intravenously stopped it again within two minutes. Three hours later the hiccup again recurred and remained continuous. About twelve hours later it stopped of its own accord.

CASE 4.—During anæsthesia for manipulation of a fractured tibia, in a man aged 40, hiccup developed. The anæsthesia was thiopentone, nitrous oxide, and oxygen. 75 mg. of pethidine intravenously (in two doses of 50 mg. and 25 mg.) stopped the hiccup within two minutes of the second dose and it did not recur.

Tel-Aviv, Israel. N. L. WULFSOHN.

1. Lee, J. A. Synopsis of Anæsthesia. Baltimore, 1950; p. 309.
2. Adriani, J. Chemistry of Anesthesia. Springfield, Ill., 1946; p. 265.

PROSTATIC OBSTRUCTION IN THE OCTOGENARIAN

SIR,—Mr. Jacobs has shown, in his article of July 10, what gratifying results may be obtained in the relief of prostatic obstruction in octogenarians. His figures, however, tend rather to understate the magnitude of the problem nowadays, for the proportion of octogenarians among his cases was only 7% (45 patients out of a total of 625). Various factors determine the age-incidence of prostatic patients in the practice of any hospital or surgeon, but it is probably true that in hospitals in which the majority of patients are admitted as emergencies, the number of the aged will be high. At the North Middlesex Hospital, for instance, where 67% of the prostatic cases are admitted with retention of urine, 13% are eighty years old or more (97 octogenarians out of a total of 731 prostatics in the last 4½ years). In many of these patients the retention is a symptom of failure of the general bodily powers in men with a slight bladder-neck obstruction previously well compensated, or the retention is precipitated by an acute illness involving some other system, especially the cardiovascular, cerebral vascular, or pulmonary. The result is that many of these patients are feeble as well as old, and many have other complicating diseases. Whereas Mr. Jacobs found nearly half his octogenarians suitable for retropubic prostatectomy, we have found only just over a quarter of ours suitable. The difference between the two figures might seem to suggest two standards of operability, but this is not supported by another look at the figures which shows that in the two complete series (they are of comparable size) an almost equal number of octogenerians was submitted to retropubic prostatectomy with a similar mortality (22 with 3 deaths; 23 with 4 deaths: the lower mortality is Mr. Jacobs's). In the poor-risk patients we have found perurethral resection very valuable and used it more often than any other single method (29 cases), but when the prostate is too big and the patient unfit for retropubic prostatectomy, there seems no very satisfactory solution although a two-stage Freyer operation often works well. A "permanent" suprapubic cystostomy is, of course, rarely done. I have been prompted to write this letter because I suspect that the problems of treating prostatic obstruction differ somewhat in different types of surgical practice.

North Middlesex Hospital, London, N.18. B. H. PAGE.

ENDOMYOCARDIAL FIBROSIS

SIR,—I read the article from the Makerere College Medical School, in your issue of May 22, with great interest. Just as the work of Trowell and his colleagues in this school has led to the syndrome of "malignant malnutrition" being recognised all over the world, it is not unlikely that, when other investigators study heart-disease along the lines indicated by these authors, this new syndrome may be found to have an equally wide distribution.

Facilities do not exist here for detailed pathological investigation, and permission for post-mortem examination is very rarely granted by the primitive Khond people of this area. On clinical grounds alone, however, I have no doubt that some of the cases of heart-disease seen here are of a similar ætiology to those now described from Africa. Frequently there is no history of rheumatic infection and no signs of coronary, thyrotoxic, or pulmonary disease or vitamin B_1-deficiency heart-disease—all rare here, as they are in Uganda. Most of these cases belong to the second group given by Dr. Ball and his colleagues—i.e., they have heart-failure with incompetence of auriculoventricular valves, usually the mitral. Two cases have been seen here resembling the obliterative endocardial fibrosis they describe.

I would like to make one comment on the work which has been done so far. Attention seems to have been focused on the pathology of the heart to the exclusion of the study of other parts which may also undergo morbid change, particularly the liver. It is possible, as was suggested at the meeting of the Royal Society of Tropical Medicine and Hygiene reported in your issue of May 29, that keloid of the skin, which is a common condition in India as well as Africa, may be related in some way to fibrosis of the heart. May it not also be possible that the dietary cirrhosis of the liver, so common amongst the malnourished of India and Africa alike, is a similar process with a different organ bearing the brunt?

Moorshead Memorial Hospital, Ganjam, Orissa, India. D. STEWART MCLAREN.

PENICILLIN IN THE TREATMENT OF DIPHTHERIA

SIR,—I have read with interest your leading article on the pathogenesis of diphtheria (May 22) and your annotation of June 5, Penicillin in Diphtheria. In 1945 we investigated the action of penicillin in the treatment of diphtheria.[1] We treated 27 cases of diphtheria of which 16 were bacteriologically positive and 11, though bacteriologically negative, were clinically typical. Of these infections, 20 were early and 7 moderately severe. The duration of the disease varied from one to eight days. All the cases recovered without complications. The temperature was normal within three days, the patches disappeared within two to five days, and throat swabs became negative within three to seven days of starting treatment. The average curative dose of penicillin was within the limit of 500,000 units. Penicillin at that time was scarce and costly and the dose schedule was 15,000 to 30,000 units intramuscularly every three hours. Frequent injections of penicillin are very trying for a child, but with larger doses the interval between injections may now be prolonged.

Our observations have been corroborated by Calvet and Herrera [2] and I think that penicillin is the treatment of choice in early and moderately severe cases of diphtheria.

Calcutta. M. N. DE.

TREATMENT OF LUPUS ERYTHEMATOSUS

SIR,—I think that an account of the following case may be of interest and help to other practitioners.

A labourer, aged 58, had had lupus erythematosus since 1950. The rash extended over both cheeks and the whole of the nose, also a patch 2 in. in diameter just above the suprasternal notch.

May to September, 1950.—Treated with quinine sulphate gr. 2 t.d.s. and 'Siccolam' cream. The only result was that he developed a crop of unpleasant boils on his neck.

May to August, 1951.—Recurrence; treated as above with the addition of 1 ml. of bismuth injection, weekly, with the same result as before.

May to August, 1952.—Recurrence; treated with mepacrine with the same result, including the boils.

June, 1953.—Relapse: this time treated with chloroquine 0·4 g. t.d.s. for three days, then once daily. No boils, and the rash cleared in twenty days.

May 12, 1954.—Severe relapse; treated with chloroquine 0·6 g. t.d.s. for two days, 0·4 g. t.d.s. for four days, then 0·2 g. t.d.s. The rash began to fade on the ninth day of treatment, and was gone by May 28—i.e., after sixteen days. During this course the patient was also given vitamin-B tablets, but no local treatment. Again there were no boils and no side-effects.

Next year I intend to keep the patient on the larger doses until the rash clears.

London, E.8. J. ZEITLIN.

1. De, M. N., Chatterjee, J. R., Ganguli, L. *Brit. med. J.* 1947, i, 376.
2. Calvet, J. R., Herrera, R. G. *Bol. Coll. méd. Habana*, 1953, 4, 501.

THE RENAL DUCTS OF BELLINI

SIR,—Last year Duran-Jorda [1] reported that after examining several hundred sections he was sceptical of accepting the existence of openings of the ducts of Bellini, and that he was considering the possibility that in the normal kidney the urine is dialysed through a pelvic epithelium and not excreted by the ducts directly into the renal pelvis. In support of this view he adduced the phenomenon of pyelovenous backflow and the fact that "aseptic renal calculi are found at the tips of the papillæ as though there were a barrier between the renal pelvis and the secretory system of the kidney." In a study of kidneys from neonates he had observed that often the terminal collecting-tubules contained a uric-acid precipitate, and that these tubules did not end in the renal pelvis but appeared to join another duct of Bellini and to finish in a "hairpin bend." In the correspondence which followed Ross [2] stated that it was easy to make 'Neoprene' casts of the ducts of Bellini by injection via the ureter, and that pyelotubular backflow, though less common than pyelovenous, was well known to urologists. He regarded these facts as militating against Duran-Jorda's views and hoped that further histological proof would be forthcoming.

We performed recently a necropsy on an infant aged 12 days, who was born prematurely weighing 3½ lb. After birth she had progressive cardiac failure, and a patent ductus arteriosus was diagnosed. The ductus was tied as the only means of aiding the failing heart, but the infant died on the day after the operation. At necropsy routine blocks of tissue were taken from various organs, including the kidneys, which, apart from slight congestion, appeared macroscopically normal. The ureters and bladder also appeared normal, and urine had been passed freely during life. Quite by chance the histological section has passed through the whole of a renal papilla (see figure). The epithelial lining of the adjacent renal pelvis is complete. No smooth muscle can be seen in the papilla. In this photograph two ducts of Bellini can be seen opening directly into the renal pelvis with no evidence of a membrane covering their openings.

Although it is usually stated in textbooks of histology that the cells lining the duct in its terminal portion are tall and columnar, the transitional epithelium of the renal pelvis is continued for a short distance into the mouths of the ducts. Other ducts on the papilla appear to have no direct com-

1. Duran-Jorda, F. *Lancet*, 1953, i, 727, 900.
2. Ross, J. A. *Ibid*, pp. 799, 950.

munication with the pelvis, and it is to this appearance, presumably, that Duran-Jorda refers. Since, however, the renal papilla is a three-dimensional structure with ducts opening over the whole of its surface, and the ducts are relatively large, it is not surprising that a thin two-dimensional slice of tissue usually reveals few or perhaps none of the openings. Again, since the ureter, renal pelvis, and collecting-tubules are but progressive divisions of a hollow outgrowth from the wolffian duct, it would be surprising if a membrane developed at some point in this system.

Bellini published his work on the structure of the kidney in 1662.

We have been unable to obtain a copy of the first edition, but we have used the second edition published in 1664.[3] Bellini was denied the advantages of a microscope and did not describe the small part of the excretory duct system now called after him, but established the fact that the kidney consists of a mass of tubules, whereas Highmore had previously described it as a solid organ consisting of numerous fibrous cords. In view of the present question at issue it is interesting, if somewhat ironic, to note the method by which Bellini demonstrated the renal tubules. He opened the kidney longitudinally from the pelvic aspect, compressed the parenchyma, and observed the small drops of fluid coming from the tips of the renal papillæ. Our own rough translation of the relevant sentences is as follows: "The urine is clearly seen flowing from the compressed tubules as if effused from so many small fountains. From which we are able clearly to assume that the substance of the kidney . . . is nothing else than a collection of small channels and capillary openings through which urine flows into the pelvis."

We offer the accompanying illustration both because of the rarity with which such a complete representation of a renal papilla is seen in routine histological sections of the kidney, and because, we believe, it supplies strong histological evidence for the existence of openings of the ducts of Bellini into the renal pelvis. That it is necessary to do so in 1954 emphasises how much is still to be learnt, or relearnt, about normal anatomy.

C. H. JONES
Royal Liverpool Children's Hospital. R. E. REWELL.

THE EMOTIONAL VALUE OF SUCKLING

SIR,—The emotional, as distinct from the nutritive, value of suckling to the child is now well known, but a recent experience has afforded me a new light upon its potentialities as an emotional gain to the mother.

The patient had been under treatment for some time on account of a neurotic personality, a principal symptom being her inability to form normal feeling or affect relationships with adults, although she could do so much better with children. One result was a partial inability to enjoy sexual experience. Treatment had, at the time of writing, modified but not cured these anomalies of personality. When her first child was two or three days old the baby sustained a slight hurt to his mouth, as a result of which he refused to suck and had to be spoon fed, and it was decided to wean him.

A day or two later the patient came to me and told me of the tragic loss involved. She described the wonderful feeling suckling gave her by saying: "It makes you feel as if nothing else matters." She then proceeded further to punish herself by allowing her husband, who was home on holiday for a week, to feed the baby every time, so that she ended the day by hating them both. The position was becoming ominous and in the discussion of this situation she said with much feeling: "I was thinking of what it was like to feed baby and then be told he was to go on the bottle . . . it had been like living for the first time. . . . Oh, I don't want to talk about it." The doctor added: "It was like life being taken away?" The patient replied: "Yes." At the next interview she said she felt completely helpless and that not being able to feed baby had made her so. As a result, evidently, of this discussion, the patient tried putting the child back to the breast, found she could do so, that he sucked again, and that her milk returned.

It is granted that the feeling aspects of suckling may be—probably are—unusually strong in this patient. Nevertheless, a ray of light is cast upon what suckling can mean emotionally to the mother. Unfortunately patients so often accept their doctors' instructions without mentioning personal difficulties of which the doctors may be unaware, thus laying on them an extra responsibility, for, if an error is made, it will usually not be known until it is too late to make any adjustment. It seems probable that weaning is sometimes advised too lightly and with insufficient attention to the possible emotional consequences.

Brentwood, Essex. DAVID T. MACLAY.

THE CARE OF OLD PEOPLE

SIR,—Reading the various comments which have been made about the International Congress of Gerontology, reported in your issue of July 31, it occurred to me that it may be of interest to your readers to know that the International Hospital Federation held a congress in Brussels in 1951 which had for its main theme the self-same subject as that which has been the object of such wide comment during the past week—the Care of Old People. Over 500 delegates from 25 countries attended this congress and took part in the discussions, which brought forth many useful ideas.

J. E. STONE
Hon. secretary and treasurer, International Hospital Federation.
London, E.C.2

MERIT AWARDS

SIR,—In his letter of July 24 Mr. Hayton-Williams draws attention to one of the many evils of the present system of remuneration of hospital medical and dental staff by his statement that consultants refrain from public criticism of the merit-award system since they feel that an open expression of their views "might be detrimental to their chances of being given a merit award."

This timidity is regrettably not confined either to consultants or to the subject of merit awards, but permeates the entire system upon which hospital medical and dental staff has been founded. The houseman, in virtue of his junior position and possible ignorance of the true state of affairs, dare not or does not criticise his conditions since he is obliged to obtain the good will of his consultant; the registrar and senior registrar likewise have more sense than to complain in public of the meagre remuneration which they receive lest they become dubbed as "political agitators" or "subversive elements" or lest they be adversely judged by selection committees prior to interview, so ruining their chances of being short-listed for a post.

The senior hospital medical officer, perennially hopeful of upgrading to consultant, keeps quiet for obvious reasons, whilst the majority of consultants, for reasons already expressed, merely grumble amongst themselves lest "a unit of the machinery for gathering information" be in their vicinity, or extraprofessional rewards should fail to come their way.

No less than five years ago a correspondent wrote in the *British Medical Journal*[1]: "We may well ask ourselves, 'How could this situation come about?' It has come about because doctors have been, since the National Health Service was first mooted, woefully disunited and disorganised, pursuing selfish aims and sectional interests and failing to come together for their own protection. Thus wedges are being driven between various sections of the profession. If doctors do not now at this late hour organise and unite, then the outlook for the doctor and his family is black indeed. And the time is short."

The consultants of this country who are prepared to stand by and see injustice done to their juniors, whilst they may or may not pocket their merit awards, are unfitted for their command. Fortunately a few men in

3. Bellini, L. De Structura Renum. 2nd ed., Florence, 1664.

1. *Brit. med. J.* 1949, ii, suppl. p. 192.

our profession have spoken up at the annual representative meeting of the British Medical Association, and it would appear that at last a committee to deal with the entire problem of remuneration along well-informed trade-union lines is to be developed. The Crichel Down case should have served to emphasise the extent to which bureaucratic control has entered our daily lives; and the public repudiation of the Spens Report by the Minister of Health in the House of Commons on July 22 provides yet another example. When we eventually succeed in forming a body whose interests are wholly, solely, and exclusively the financial and political welfare of the medical and dental profession, let us choose its members with considerable care, bearing in mind Kipling's words:

"Shall we only threaten and be angry for an hour?
When the storm is ended shall we find
How softly but how swiftly they have sidled back to power
By the favour and contrivance of their kind?"

Andover. N. L. ROWE.

HOSPITAL MEDICAL RECORDS

SIR,—Tracing a family history of diabetes for research purposes recently, I was glad to be able to see a note of glycosuria in the case-papers of a man admitted to hospital for cataract extraction in 1905. Case-records once destroyed are irreplaceable; every effort should be made to preserve them as long as possible, certainly longer than the six-year minimum suggested by the Ministry.[1]

Harrogate, GEORGE JOHNSON.

BLOOD-GROUPS AND AGE-GROUPS

SIR,—Findings similar to those pointed out [2] in Fraser Roberts's sample [3] of 85,438 war-time civilian blood-donors in the six south-western counties of England are obtained from Hart's sample [4] of 10,748 war-time civilian blood-donors in eastern rural districts of Ulster.

First, the mean age of the group-B males is two years lower than that of the A and O males (as Hart himself pointed out), while the mean age of the group-B females is between three and four months higher than that of the A and O females. Secondly, the percentage of male donors who are group B falls from the second to the sixth decade of life, the figures being respectively 12·5, 11·3, 9·6, 8·5, 7·4. Thirdly, the ratio of male to female group-B donors falls from the second to the sixth decade, relative to that of the A and O donors; the figures for the B donors are respectively 0·45, 0·51, 0·54, 0·59, 0·51, and for the A and O donors combined they are 0·38, 0·46, 0·66, 0·73, 0·75. Lastly, the over-all sex-ratio of the group-B donors is lower than that of the A and O donors, being 0·55 for the O donors, 0·54 for the A donors, and 0·51 for the B donors. When, however, Hart's sample is combined with that of Fraser Roberts's as in table I, it is seen that the lower sex-ratio of the group-B donors is confined to those over 30 years of age; and the descending order of sex-ratios in the over-30 donors—namely O–A–B—is found to be the reverse of that in the under-30 donors. Thus, the findings would suggest that the viability of group-B males may, in general, fall more quickly, from a higher level, than that of A or O males.

TABLE I—RATIO OF MALE TO FEMALE BRITISH BLOOD-DONORS

No. of donors under 30		Group of donors	Ratio of male to female donors		Group of donors	No. of donors over 30	
Male	Female					Male	Female
998	2318	B	0·43	0·66	O	10,120	15,448
4933	11,677	A	0·42	0·65	A	9617	14,910
5201	12,665	O	0·41	0·61	B	1842	3042

1. See *Lancet*, July 24, 1954, p. 180.
2. Allan, T. M. *Ibid.*, 1953, ii, 456.
3. Fraser Roberts, J. A. *Ann. Eugen., Lond.* 1948, **14**, 109.
4. Hart, E. W. *Ibid*, 1944, **12**, 89.

TABLE II—RATIO OF MALE TO FEMALE ILL AND WELL FINNS

No. of ill people		Group of ill people	Ratio of males to females		Group of well people	No. of well people	
Male	Female					Male	Female
1060	1109	B	0·96	1·16	O	2308	1991
2633	2978	A	0·88	1·16	A	2762	2378
2010	2313	O	0·87	1·16	B	1141	980

Now, if this were indeed the case, as evidenced by the blood-group distribution of what is probably the most healthy—namely, the blood-donating—section of the adult community, one would expect to find complementary evidence of it in the blood-group distribution of what is certainly the *least* healthy section of the community—i.e., hospital patients. In other words, one would expect to find that B males are, in general, more liable to disease than A or O males: and this is found to be so in the only three studies [5–7] of the subject known to me. In all three the descending order of the ratios of male to female patients is B–A–O; the figures for the three samples combined are given on the left-hand side of table II. These samples consist of Finnish hospital patients, nearly all adults with medical diseases; and the right-hand side of table II gives the corresponding combined figures for four samples of *healthy* Finns—the samples of Streng and Ryti,[5] Mustakallio,[7] Vuori,[8] and Kyrklund.[9] Here the sex-ratio of the B subjects is the same as that of the A and O subjects, but the aggregation of the samples conceals at least two anomalies.

The first of these anomalies is that the sample of Kyrklund consists of school-children, and that its descending order of sex-ratios is O–A–B, whereas the order might, in this context, have been expected to be the same as that of the younger British blood-donors—namely, B–A–O. The second anomaly is that the healthy B subjects both of Streng and Ryti and of Mustakallio have a higher sex-ratio than their A or O well subjects, though against this is the fact that the ratio of ill to well B males is higher in both samples than the ratio of ill to well A or O males. Moreover, in Mustakallio's sample the descending order of percentages of group B subjects—namely, ill males (17·9%), well males (16·4%), ill females (15·0%), well females (13·7%)—is the same as that found in the sample of Streng and Ryti, in which the corresponding figures are 17·5%, 17·2%, 16·8%, 16·1%; and other parallels are found in the other three ABO groups.

It is also of interest that Mustakallio sub-grouped most of his A and AB subjects, and that the descending order of sex-ratios in his ill subjects, namely, 0·90 for A_1B (66 : 73), 0·77 for A_1 (475 : 617), 0·75 for A_2 (163 : 217), 0·48 for A_2B (29 : 61), is the reverse of that in his well subjects—namely, 3·00 for A_2B (48 : 16), 1·99 for A_2 (153 : 77), 1·57 for A_1 (454 : 290), 1·46 for A_1B (60 : 41).

In my previous letter [2] I said that the possibility of the ABO blood-groups being of unequal survival value was first suggested and investigated by Graves, but in fact this author had been preceded by several others. Oppenheim and Voigt,[10] in a sample of 500 necropsy subjects in Munich, found the mean age of the O subjects to be 53·1, of the A subjects 52·5, and of the B subjects only 50·2, although below the age of forty the mortality of the Bs was slightly lower than that of the As and Os. The lowest mean age at death was that of the B males, and the second lowest that of the B females, the death-rate being at its peak in the forties for the B males and the B females, in the fifties for the O males, the O females, and the A males, and in the sixties for the A females.

These facts led the authors to suggest that B individuals may have, on average, a shorter life-span than A or O individuals, and Hirszfeld [11] considered whether the same conclusion might justifiably be drawn from the findings

5. Streng, O., Ryti, E. *Acta Soc. Med.* 'Duodecim,' 1927, **8**, fasc. 1.
6. Sievers, O. *Finska LäkSällsk. Handl.* 1929, **71**, 836; *Ibid*, 1931, **73**, 960.
7. Mustakallio, E. *Acta Soc. Med.* 'Duodecim,' 1937, **20A**, fasc. 2.
8. Vuori, A. K. *Ibid*, 1929, **12**, fasc. 1.
9. Kyrklund, R. *Ibid*, 1932, **15A**, 1.
10. Oppenheim, F., Voigt, R. *Krankheitsforschung*, 1926, **3**, 304.
11. Hirszfeld, L. Konstitutionsserologie und Blutgruppenforschung. Berlin, 1928.

of Thomsen.[12] The latter had found that while the percentage of B individuals was 11·8 in the general population of Copenhagen, it was only 8·3 in a sample of 1151 Copenhagen people over the age of 65—a figure which would have been lower still had there not been a considerable excess of B males in the over-85 group. Hansen,[13] on the other hand, found that, in a sample of 2001 Danes, the percentage of B individuals, while 11·1 in the under-35 age-group, was 13·7 in the over-35 age-group, but unfortunately he did not divide his subjects according to sex.

Aberdeen and North-East of Scotland Blood Transfusion Service, Bacteriology Department, University of Aberdeen. T. M. ALLAN.

SALARIES IN THE PUBLIC-HEALTH SERVICE

SIR,—Dr. Lambert's letter last week makes some praiseworthy comments but prompts the thought that the idealist should not be too remote from reality. We have, unfortunately, to contend with human nature as it is, and not as we would like it to be. In the interests of the community financial remuneration should be so fashioned as to attract to each socially necessary occupation sufficient talent. If the public-health service has a value to the community and if, because of its relatively poor financial prospects, it cannot obtain an adequate number of suitable recruits, then, in the public interest, a remedy should be applied. This could be done by raising remuneration in the public-health service or lowering it in the other branches of the profession. The former course has the merit of practicalness.

Stockton-on-Tees. HENRY J. PETERS.

BRONCHIOLITIS TREATED WITH DETERGENT AEROSOLS

SIR,—Mr. Brennig James (May 29) would be on somewhat firmer ground if only "partially dried mucus film" were involved. The inflammatory nature of the condition, however, introduces "elements" unaffected by either water or hyaluronidase; the latter, in any case, does not supply the water which Mr. James considers necessary in this pathological situation. Viscosity depends not only on the presence of mucin but also on the ratio of "inflammatory" and desquamated tissue cells to the "fluid" of the exudate, and on nucleoprotein, colloids, and the preponderating enzyme production of the infecting agent—i.e., whether coagulative or liquefactive."

The colloids of the inflammatory scene, while possessing surface tensions bordering on that of the solvent serous and tissue-fluid exudate, are, as anyone who blows his nose, spits, or coughs knows, given to precipitation, aggregation, and clumping. Detergents, by their very considerable action in lowering surface tension, will therefore have an emulsifying action well suited to the formation of a "particle" of ideal size for the self-cleansing mechanism of ciliary action.

By detergent-assisted opaque studies in sinusitis, I have demonstrated a "permeating" and "spreading" action, obviously necessary in situations amounting to more than the superficial "partially dried mucus film" which Mr. James envisages. Detergent-assisted sinus lavage has, furthermore, verified its "embracing" action vis-à-vis all inflammatory elements, and I have found it superior to the unaided normal saline solution.

The steam kettle of the past, dressed up, is the treatment proposed by Mr. James, but I think the aid of detergents is a definite advance in treatment. Their action represents a "natural" mechanism in the body's processes, and helps to make therapy what it ought to be—namely, applied physiology. What is right in principle, therefore, stands an excellent chance of being right in practice.

Cape Town. M. GLASS.

12. Thomsen, O. *C.R. Soc. Biol. Paris*, 1927, **97**, 198.
13. Hansen, S. *Hospitalstidende*, 1928, **71**, 767.

HYALURONIDASE AND PARAPHIMOSIS

SIR,—I was interested to read your annotation of July 24, which has prompted me to record the following case.

On June 26, while cleaning my car preparatory to going on holiday, I was called in by a neighbour whose three-month-old baby was greatly distressed. The prepuce had been drawn back with difficulty during washing but the mother was unable to return it to the usual position. The glans was much swollen and purplish in colour, and I, too, was quite unable to replace the prepuce. However, it seemed worth trying the effect of 'Hyalase,' 1000 Benger units of which were dissolved in 5 ml. of procaine. About 0·5 ml. was injected at the root of the glans on each side. Within five minutes the swelling was greatly reduced and the prepuce was replaced without difficulty.

Cradley Heath, Staffordshire. G. A. AMES.

ROUTINE WASSERMANN TESTING IN OUTPATIENT CLINICS

SIR,—I have just reviewed my results for the past five years of routine Wassermann testing of all patients referred to me. The following are the interesting figures:

		Positive
No. of patients tested	7808	51 (or 1 : 153)
Obstetric	4363	21 (or 1 : 208)
Gynæcological	3445	30 (or 1 : 113)

Orpwood Price[1] found that out of a total of 6809 antenatal patients recently investigated in London 44 (or 1 : 154) patients were found to have positive Wassermann reactions. My results show that 1 patient in every 113 attending my gynæcological clinic had a positive reaction.

The Ministry of Health has kindly supplied me with the results of completed examinations by another kind of routine survey—mass radiography—for the period October, 1943, to June, 1953. The total number of examinations was 12,053,011; and 3·3 per thousand (or 1 : 303) had active tuberculosis.

A great deal of publicity is given today to mass radiography, which, of course, discovers many other lesions besides tuberculosis. I feel that insufficient attention is paid to the routine Wassermann test. My results, taken from a representative sample of the population, suggest that all adult patients attending any outpatient clinic should have a routine test.

Peterborough. NORMAN KIMBELL.

AN AMERICAN IN BRITAIN

SIR,—Dr. Dent (July 24) is anxious that our American readers should believe that the average British doctor is in favour of the expulsion of Dr. Cort or, alternatively, that he does not wish to be asked to form and express any opinion on such matters.

Dr. Dent is statistically minded. He is interested—perhaps not exclusively but certainly preferentially—in the views of *average* British doctors; there is more than a hint of bias against freedom being extended to "energetic minorities" to express their views in the medical press. Neither Dr. Dent's wishes about American judgments on British medical opinion nor my views on Dr. Dent's attitude are of any statistical importance. I do not think however that they should be ignored for that reason. They may have other values.

Statistical research gives us invaluable information which we can use to obtain desired results in the world of quantitative values; but every fruitful statistical research is the result of accurately observed quantitative facts considered in the light of more or less arbitrary assumptions; and it is logically permissible to make such assumptions only if they are open to revision. In this case it seems to be assumed that the opinion of the average British doctor, unwilling or unable as we must surely agree he is to verify the alleged facts in the

1. Orpwood Price, H. N. *Brit. med. J.* 1954, **1**, 637.

case of Dr. Cort, would become a valuable guide to right judgment in the case if it were ascertained statistically. There seems to be no evidence in favour of this assumption.

Wilfred Trotter [1] described a type of mind with a "gift for forming the backbone of the state . . . which their very stability shows to possess a certain relative incapacity to take experience seriously, a certain relative insensibility to the value of feeling and to suffering, and a decided preference for herd tradition over all other sources of conduct."

Such values are not quantitatively measurable; they are not statistically significant or relevant; but they cannot be ignored in the right ordering of human affairs.

London, W.1. J. NORMAN GLAISTER.

TREATMENT OF TETANUS

SIR,—Dr. Shackleton's article of July 24 describes an important advance in the treatment of severe cases of tetanus. This consists in paralysing the patient with a relaxant and maintaining respiration with intratracheal intermittent positive pressure, in the way devised for cases of poliomyelitis (Lassen [2]). We have recently had satisfactory experience of this form of treatment in a case which failed to respond adequately to sedation or to mephanesin. He was kept partially or totally paralysed for six days, and respiration was maintained mechanically in a way that has been previously described from this hospital (Crampton Smith et al.[3]). Recovery thereafter was uneventful. It is hoped to publish details of this case at a later date.

G. E. HONEY
B. E. DWYER
A. CRAMPTON SMITH
J. M. K. SPALDING.

Radcliffe Infirmary, Oxford.

Parliament

Ageing Limbless Pensioners

IN the House of Commons on July 28, Mr. HORACE KING called attention to the failure of the Government to raise the basic rate of pension for disabled ex-Servicemen. He particularly urged the claim of the 23,000 who had lost a limb in the 1914–18 war. The Minister had said that he must defer considering this question until the Rock Carling Committee had reported. But Mr. King affirmed that whatever the medical testimony of this important committee might be, they still demanded an extra allowance for those men on the grounds that the disabilities, discomforts and handicaps of old age became more grievous for someone who had lost a limb.

Brigadier J. G. SMYTH, joint parliamentary secretary to the Ministry of Pensions and National Insurance, said that in 1946–47 the Hancock Committee came to the conclusion that no increased pension was necessary to compensate for age and that the criterion that the pension should be given for loss of amenities comparing a disabled with a fit man of the same age should continue to hold good. But as a result of that committee a large number of increases in pensions were given, and the Ministry were always ready to consider any particular case. The Rock Carling Committee was set up in 1950 to consider whether the amputee was more prone to cardiovascular disorders than any other section of the community, and whether the amputee, as a result of the amputation and wearing an artificial limb, might have a shorter expectation of life. After presenting its final report in 1953 the committee asked for a clinical examination of 5000 amputees to confirm the first impressions gained simply from the perusal of medical records. The clinical examinations were completed last March and it was hoped that the committee's report would be submitted within a few months. The Minister hoped that the investigation would not show that the amputee's expectation of life was lessened or that he was more prone to cardiovascular disorders. But if the committee reported that amputees were more prone to such disorders than other sections of the community, obviously the Government would have to review all their assessments on amputations, and he could guarantee that they would do so.

1. Instincts of the Herd in Peace and War. London, 1947; p. 55.
2. Lassen, H. A. *Lancet*, 1953, i, 37.
3. Crampton Smith, A., Spalding, J. M. K., Russell, W. R. *Ibid*, 1954, i, 939.

Trilene as Analgesic in Childbirth

Replying to a question, Mr. IAIN MACLEOD, Minister of Health, said that the Medical Research Council had now, after prolonged investigations and trials, recommended that midwives acting on their own responsibility after adequate instruction be permitted to administer 'Trilene' with inhalers conforming to an approved specification. He was informed that the Central Midwives Board had accepted this recommendation and he was now in consultation with the board as to the measures necessary to give effect to it.

QUESTION TIME

Unstaffed Hospital Beds

Replying to a question Mr. MACLEOD said that the following were the numbers of hospital beds unused for lack of staff in both teaching and non-teaching hospitals at Dec. 31, 1953:

Region	*Unstaffed beds*
Newcastle upon Tyne	276
Leeds	728
Sheffield	956
East Anglian	481
N.W. Metropolitan	1857
N.E. Metropolitan	1716
S.E. Metropolitan	5172
S.W. Metropolitan	1997
Oxford	480
South Western	591
Welsh	442
Birmingham	2175
Manchester	1729
Liverpool	191
Total	18,791

Aftercare of Mental Patients

Mr. HECTOR HUGHES asked the Secretary of State for Scotland how many homes there were in Scotland under his control for the aftercare of mental patients.—Mr. JAMES STUART replied: If the hon. Member has in mind a form of care distinct from that afforded by a hospital or under guardianship, the provision of accommodation for the purpose, so far as appropriate to public authorities, would rest with local authorities rather than with me. There are at present no such homes in Scotland, nor has any provision been made by voluntary organisations.

Psychiatric Research in Scotland

Replying to questions Mr. STUART said that in Scotland specific allocations from National Health Service funds for research projects in psychiatry amounted to £326 in 1952–53 and to £2329 in 1953–54. The figure for 1953–54 included £578 for the Crichton Royal. Complete figures were not available for expenditure from endowments and other sources, but the board of management for the Crichton Royal informed him that expenditure from their endowment funds was £1416 in 1952–53 and £4966 in 1953–54. The Hospital Endowments Research Trust would shortly be in a position to provide financial assistance for suitable projects.

Public Health

Second Quarter in England and Wales

THE Registrar-General [1] announces the following provisional figures for England and Wales in the quarter ended June 30 this year (corresponding figures for the same quarter last year in parentheses): birth-rate 16·0 (16·4) per 1000 population; stillbirth-rate 23·1 (22·9) per 1000 total live and still births; death-rate 10·7 (10·5) per 1000 population; and infant-mortality rate 24·7 (25·6) per 1000 related live births—a record low rate for a June quarter.

1. Registrar-General's return for the week ended July 17. H.M. Stationery Office. Pp. 20. 1*s*.

Obituary

THOMAS PERCY CLAUDE KIRKPATRICK

B.A., M.D., Litt.D. Dubl., D.Litt. N.U.I., F.R.C.P., F.R.C.P.I.

Dr. T. P. C. Kirkpatrick died in Dublin on July 9 at the age of 85. As registrar of the Royal College of Physicians of Ireland, vice-president of the Royal Irish Academy, general secretary of the Royal Academy of Medicine in Ireland, and physician to Dr. Steevens' Hospital, a university lecturer on anæsthetics, and honorary professor of the history of medicine in the University of Dublin, he had served his profession dutifully and devotedly for nearly sixty years.

He entered Trinity College, Dublin, as a junior exhibitioner, in 1887, and he graduated with a first-class degree in arts, as a senior moderator in ethics and logic, before he took his medical degrees in 1895. Throughout his life, his literary interests were wide and scholarly, and his books, of which the best known are *A History of the Medical School of Trinity College, Dublin* (1912), *The Book of the Rotunda Hospital* (1914), and *A History of Dr. Steevens' Hospital: 1720–1920* (1924), gained for him the unusual double distinction of the degree of doctor of letters of the University of Dublin and of the National University of Ireland.

Biographical details only reveal the skeleton of the man, and in himself Kirkpatrick epitomised a tradition, exemplified an equanimity, and embodied a spirit of friendliness that enriched and illuminated his circle. His professional reputation began as an anæsthetist in the first decade of this century, when new drugs and new methods were encroaching on the domain of chloroform and ether. I recollect my first surgical teacher, Sir Charles Ball, referring doubtfully to the innovations: "You might gain on the swings what you lost on the roundabouts, but the swings might carry you over the Jordan." Having had experience of an ether roundabout that seemed to carry me over the Jordan and, reluctantly, back again, it was comforting to be told: "If Kirk had given you the anæsthetic you would have enjoyed it." Years later, I attended Kirkpatrick's lectures on anæsthetics, and discovered one reason at least for his success: in some subtle way he was able to identify himself with his patient. This quality extended to the general walks of life. Like the Chinese sage, Kirk received and treated whoever approached him as an honoured guest.

A bachelor, secure in the fortress of his library and his learning, he yet found time to keep old friendships in repair and to make new ones. He was equally at home in any of the three clubs to which he belonged, and with any group of people that chance or design might gather around him. Temperamentally and necessarily aloof from the vexations of contemporary Irish politics, he found serenity in shades of Berkeley and Burke: "We are born only to be men. We shall do enough if we form ourselves to be good ones."

W. F.

GEORGE WILLIAM KOSMAK

M.D. Columbia

Dr. George W. Kosmak, who died on July 11 at the age of 80, was best known in this country as the editor, since its foundation over thirty years ago, of *The American Journal of Obstetrics and Gynecology*. Under him this journal has established itself as one of the most important periodicals in the specialty in the world and it is common knowledge that through his wise and inspired direction it has exercised a powerful influence in American obstetrics and gynæcology. The latest issue, a Festschrift in celebration of his 80th birthday to which many of his colleagues and friends in America and throughout the world contributed, appeared only a few days before his death. There is, however, some consolation in the knowledge that this fine tribute was placed in his hands before he died.

Dr. Kosmak was a pioneer in the movements for the reduction of maternal and infant mortality. As early as 1917 he strongly advocated a public-health effort to this end. Despite the general apathy which met his first proposals he persisted, and in 1928 an important subcommittee of the public-health relations committee of the New York Academy of Medicine was set up with Kosmak as a member. In 1932 this subcommittee issued its well-known report, *Maternal Mortality in New York City—A Study of All Puerperal Deaths, 1930–32*. Towards the same end Dr. Kosmak gave his enthusiastic support to the efforts which led to the foundation in 1930 of the American Board of Obstetrics and Gynecology and thus to the improvement in the standards of the teaching and practice of the specialty. He had many friends and admirers in this country, and in 1950 the Royal College of Obstetricians and Gynæcologists conferred on him its honorary fellowship.

JOHN ALEXANDER

M.A., M.D. Pennsylvania

Dr. John Alexander, professor of thoracic surgery in the University of Michigan, died at the University Hospital at Ann Arbor on July 16. Doctors from all over the world had visited his unit to study his methods and technique, and his many British friends will remember his courage and courtesy and the hospitality he and his wife gave to overseas colleagues.

He was born in 1891 and he graduated from the University of Pennsylvania School of Medicine in 1916. During his service in France in the first world war he contracted tuberculosis, and he suffered from this disease at intervals for the rest of his life. In 1920 he joined the faculty of medicine of the University of Michigan as an instructor, and in 1932 he was appointed to a full professorship. He was also head surgeon at the Michigan State Sanatorium at Howell.

His publications included *The Surgery of Pulmonary Tuberculosis* (1925) in which he reviewed the experience of all the surgeons and physicians of the world who had interested themselves in thoracic surgery, extracting the pith of 500 books, papers, and personal communications. For this study he was awarded the 1925 quinquennial Samuel D. Gross prize of the Philadelphia Academy of Surgery. His *Collapse Therapy of Pulmonary Tuberculosis* told the story of this form of treatment up to 1937 and weighed carefully the pros and cons of each operation and its modifications. In 1941 he was awarded the Trudeau medal of the National Tuberculosis Association of America. He was also a president of the American Society of Thoracic Surgeons.

A. J. R., who spent "an exceptionally happy year" at Alexander's unit, writes: "His indomitable spirit fought a long battle with tuberculosis for his patients and for himself, and even in the end this disease did not conquer him. Characteristically, he wrote his book on collapse therapy whilst lying on his back, and invented a special book-holder to enable him to do it. His experiences with his own illness gave him great insight into the problems of his patients. A few years ago I sent a follow-up questionnaire on his behalf to several hundred patients of his, and I was astonished to read the many personal letters that came back asking affectionately after his own health. 'John A,' was a fearless critic, of great intellectual honesty, who set the highest standard for himself, and expected it from his staff. He had gained many honours in his own land, but perhaps it would please him more that so many surgeons and physicians throughout the world are grateful for his teachings."

THOMAS WILFRID LETCHWORTH

M.A., M.D. Camb., F.R.C.S.

Dr. T. W. Letchworth, consulting surgeon to the Royal Eye Hospital, London, died on July 22.

He was born at Brighton in 1874, and he was educated privately and at Emmanuel College, Cambridge. He graduated B.A. with honours in 1895 and he continued his medical training at St. Bartholomew's Hospital. He qualified in 1898 and his experience as house-surgeon to Vernon and Jessop stimulated his interest in ophthalmology. After a year as general house-officer at Winchester he settled in general practice at Bournemouth in 1902. Here he remained until 1908 when he decided to break with general practice and return to ophthalmology. With characteristic purpose he set out to get his F.R.C.S., and after obtaining it with ease in 1909 he became house-surgeon at the Royal Westminster Ophthalmic Hospital,

where he came under the influence of Brewerton, to whom he always acknowledged his great debt. In 1911 he settled at Surbiton, where he quickly formed the nucleus of one of the first suburban ophthalmic practices. He became surgeon to the Royal Eye Hospital in 1915, and it was with this hospital that the greater part of his career was associated. He was also consultant to the Hampstead General and SS. John and Elizabeth Hospitals, and a number of L.C.C. hospitals and school clinics.

Letchworth retired from the Royal Eye on reaching the age-limit in 1934, but with great humility and helpfulness he remained to act for three more years as honorary clinical assistant. He continued in consulting practice until three years ago, when he still kept on a small amount of work, "to keep his hand in." During the first world war he was local secretary of the Kingston branch of the B.M.A., and after his busy day at the Royal Eye he would come home and work far into the night as secretary of the local medical war committee. In 1947, at the age of 73, and after two cataract operations, he wrote an original thesis for his M.D. degree and took his degree on the same day that his son took his M.A. at Cambridge. He was probably the oldest M.D. to proceed to his degree in this way. He was particularly proud of his distinction and last month at the opening of the Courage Laboratory at the Royal Eye Hospital he wore his gown to the delight of his colleagues.

T. M. T. writes: "Letchworth was a delightful character, of the type that is fast disappearing from the ranks of our profession. He had the most delicate sense of humour, and nothing delighted him so much as a sly leg-pull successfully carried out on some unwitting colleague. All those with whom he came in contact could not fail to be attracted by his kindliness, his unselfishness, and his wide knowledge. He was a first-class French, Latin, and German scholar and could quote pages of Molière by heart. He was also a first-class mathematician and could put his knowledge in this sphere to practical use for he was among the first to produce a variable prism for use in refraction work. His fame as a teacher of ophthalmic surgery will be kept green by the number of operations popularised among his house-surgeons and students and still often performed by them. He was a first-class teacher, often using his ready sense of humour to illustrate his points. His bright eyes twinkling behind his gold-rimmed spectacles, and the straggly white beard, through which he constantly ran his fingers, will be recalled by many, along with the legendary stories of his amiable and harmless eccentricities. He was a keen sportsman, but he was best known as a swimmer. He also was no mean chess player, and he represented Surrey many times. Nothing in his life gave him more pleasure than when his eldest son rowed twice in winning Cambridge crews in 1927 and 1928. Since his wife's death he had been noticeably less alert, *though he died as he always wished, in a light harness.*"

Letchworth married Miss Edith Worth, of Bournemouth, in 1903. She died two years ago, and they leave two sons and a daughter.

FRANCIS WILSON STUART

M.D., Ch.M. Aberd.

Mr. Wilson Stuart, surgeon to the Royal Orthopædic Hospital, Birmingham, died on July 29, at the age of 69.

He was born at Gartly, Aberdeenshire, where his father was the minister, and he was educated at Gordon School, Huntly, and the University of Aberdeen where he graduated M.B. in 1909. He held house-appointments in Aberdeen, Dundee, Bury St. Edmunds, and Coventry before he moved to Birmingham in 1912 as resident assistant surgeon at the Union Infirmary. In 1913 he proceeded to the degree of CH.M., and the following year to the degree of M.D.

During his service with the R.A.M.C. in France during the 1914–18 war he was more and more drawn to the growing specialty of orthopædics, and in 1917 he joined the team at the special surgical hospital at Hollymoor as an assistant to the late Naughton Dunn. Under Dunn's influence he continued this work after the war, in Birmingham, at the Royal Orthopædic Hospital, the Cripples Union, and the Highbury Orthopædic Hospital, and at the Shropshire Orthopædic Hospital at Oswestry. He also joined the staffs of the Paybody Hospital, Coventry, Manfield Orthopædic Hospital, Northampton, and Warneford General Hospital, Leamington Spa.

J. F. B. writes: "Many cripples will mourn Francis Wilson Stuart. For nearly 40 years he had devoted his attention to the alleviation of their sufferings and disabilities. His colleagues knew him to be a loyal friend who was fearless in his support of any just cause; there are many who have to thank him for his kindly advice in the treatment of patients before and after operation. The orthopædic nurses and electrotherapists had in him a champion who spared no effort to improve their training and secure their rightful recognition."

Mr. Wilson Stuart leaves a widow, two daughters, and a son.

MR. CORTLANDT MACMAHON, instructor for speech defects and breathing exercises to St. Bartholomew's Hospital from 1911 to 1939, died at his home at Farnham, Surrey, on July 30 at the age of 79. During the 1914–18 war he treated many patients whose speech had been affected by gunshot wounds of the chest and abdomen or by gas-poisoning, and he reported in the medical journals the treatments he devised for the after-effects of empyema, and pulmonary tuberculosis, and for visceroptosis. He was elected a governor of Barts after his retirement.

Births, Marriages, and Deaths

BIRTHS

ALMS.—On July 16, in Mauritius, to Beryl, wife of Michael Alms, F.R.C.S.—a daughter (Charlotte Kimi).

Appointments

BADHAM, J. N., M.R.C.S., D.P.M.: asst. psychiatrist, Little Plumstead mental-deficiency group of hospitals.

BUXTON, K. L., M.A., M.B. Camb., F.R.C.S., D.T.M. & H.: consultant physician and medical superintendent, Mildmay Mission, London.

CAMERON, CHARLES, M.B. Glasg.: director in charge of East of Scotland Blood Transfusion Service and asst. pathologist, Dundee Royal Infirmary.

COOK, J. B., M.D. Lond., M.R.C.P.: neurologist, Pinderfields General Hospital, Wakefield.

CULLINGFORD, D. W. J., M.B. Lond., F.F.A. R.C.S., D.A.: part-time consultant anæsthetist, Mid-Worcestershire, Birmingham (Dudley Road), and Birmingham (sanatoria) groups.

FAWCETT, J. W., M.D. Camb., M.R.C.P.: part-time consultant physician, King George Hospital, Ilford.

FISH, F. J., M.B. Lond., M.R.C.P., D.P.M.: whole-time senior asst. psychiatrist, Carlton Hayes Hospital, Narborough, near Leicester.

HODGES, H. CHRISTINE, B.SC., M.B. Wales, D.M.R.T.: part-time consultant radiotherapist in charge of the department, St. John's Hospital for Diseases of the Skin, London.

JAMIESON, J. G., M.A., B.M. Oxfd, D.C.H.: senior school M.O., Leeds.

KARLISH, A. J., M.D. Rome, M.R.C.P.: consultant, Reading chest clinics.

MCEWAN, J. M., M.B. Glasg., D.P.H.: M.O.H., urban districts of Hexham, and rural districts of Bellingham, Haltwhistle, and Hexham.

O'NEILL, D. W. J., M.R.C.S.: asst. county M.O., Cheshire.

PEREIRA, P. F. A., M.B. Madras, D.P.H.: asst. physician (geriatrics), East Suffolk and Ipswich hospital group.

WALKER, G. L., M.B. Edin.: whole-time asst. chest physician (S.H.M.O.), Dudley and Stourbridge group.

Appointed Factory Doctors:

JONES, D. R. M., M.B. Lond.: Brynamman, Carmarthen.
MCADOO, H. MCC., M.B. Belf.: Manchester south-west district.
MARTIN, HELEN F., M.B. Edin.: Bunessan, Argyll.
RODGER, N. O., M.B. Glasg.: Arisaig-and-Moidart, Inverness.

Colonial Medical Service:

BERNEZ, E. G. A., M.B.: resident M.O., St. Lucia, Windward Isles.
CHRISTIAN, F. F., M.B. N.U.I.: M.O., Gold Coast.
FORREST, C. R., M.D. Glasg.: M.O., Hong-Kong.
FRANKS, A. C., M.B. Camb.: senior M.O., Tanganyika.
GENTLE, G. H. K., M.R.C.S.: M.O. (grade A), Caribbean medical centre.
GRAY, D. K., M.B.: M.O., South Pacific health service, Fiji.
HART, P. L. DE V., M.D. Lond., M.R.C.P.: M.O., Federation of Malaya.
LUCK, L. C., L.R.C.P.E., D.A.: anæsthetist, medical department, British Guiana.
KILLEN, O. H., M.B. Dubl.: M.O., Kenya.
PENROSE, A. G., M.B.: M.O., Seychelles.
ROBERTSON, E. L. S., M.B. Aberd., F.R.C.S.E.: M.O. (grade A), Colonial Hospital, San Fernando.
SWALES, K. A., M.B. St. And.: district M.O., St. Lucia, Windward Isles.
TWOHIG, J. N., M.B. N.U.I.: senior M.O., Uganda.

Notes and News

A SCHOOL FOR CEREBRAL-PALSIED CHILDREN

THE searchlight which has been directed on cerebral palsy in the last decade has done some harm as well as much good. Emphasis on the fact that people handicapped in this way may be normal mentally has no doubt improved the reception they get from strangers; but it has also encouraged parents to believe or hope that every cerebral-palsied child can benefit from special schooling, even though he may be grossly subnormal mentally; and those who manage schools for such children inevitably have the painful task of turning many away.

The Percy Hedley School for Spastic Children (which incorporates the Friends of Spastic Children, N.E. area) was opened in Newcastle upon Tyne[1] in February of last year, with 7 children in residence and 5 day pupils. It had the good fortune to have the late Sir James Spence as chairman of its medical advisory committee. The plan is that the school should serve the whole of the Newcastle Hospital Region, which includes Northumberland, Durham, Cumberland, part of Westmorland, and the North Riding of Yorkshire, and has a total population of 3 million. An initial task, as Mr. Frank W. Wilkin, chairman of the management committee, says in the second annual report, was to discover how many cerebral-palsied children there were in the region, and to compile a register. Dr. Errington Ellis, medical director of the school, began at once to make a survey, and to examine medically every child discovered. In addition some homes were seen, the social circumstances were assessed, and an idea was formed of the way the child and the other members of the family had adjusted themselves to the situation. By last October, there were 240 names on the register, and the third annual report (June, 1954) mentions that the survey is still in progress. Assuming an incidence of 1·5 per 1000 population there should be some 900 children with cerebral palsy aged 16 and under, in the region, and between a third and a half of these will be mentally incapable of profiting from formal education.

At present the committee feel justified in admitting only those who are of normal intelligence but so handicapped physically that they cannot attend any other school. Those accepted have been carefully chosen, often after a trial period in the school. There are at present 20 places for day children, and these seem to be enough to meet the needs of Tyneside; but of course there is much more pressure on resident places, which are filled from the whole area. At present the school can take only 12 residents, but building plans are going forward which should make it possible to take another 4. Ultimately the committee hope to offer places for 20 residents and 20 day pupils, and that amount of accommodation, they think, should enable them to admit all the children with cerebral palsy living in the region who have a moderate or severe physical handicap and normal intelligence, and who cannot thrive in other types of school. The number seems small, but in fact many palsied children with normal intelligence *have sufficient physical capacity to do well in the schools*, whether sheltered or unsheltered, provided by the local education authorities: some hemiplegics, for instance, make good progress in ordinary schools, and other patients with somewhat greater disabilities do well in open-air schools or schools for the physically handicapped. The Percy Hedley School, besides catering for a special group of children, is something of an advisory centre. Children coming in for *assessment may often be recommended to local-authority* schools suited to their special temperaments and needs. Other children, after a period of training, may be able to pass into an ordinary school, and one has already done this. This work of assessment and transfer helps to maintain a turnover in the school, which otherwise might seldom have a place to offer to a newcomer.

The 32 children attending at present are not only receiving normal schooling, with the aid of equipment adapted to their needs, but are being given training in muscular coördination by physiotherapists trained in the methods used by the Bobaths. Speech training is also given to those who need it. The children are encouraged to do all they can for themselves—to wash, dress, and feed themselves, and make their own way to the toilet and back. This training in independence is part of the life of the school. The resident children go home at week-ends, thus remaining a part of their family group; and the staff keep in close touch with the parents, who have much to learn about the best ways of helping these children. A small group of mothers have voluntarily chosen to give part-time help in the school.

Thanks to the students of King's College, Newcastle, who collected nearly £12,000 for the school in the course of their last Rag Week, the committee are shortly to build a clinic where children not in the school can be brought for advice. Appropriate handling of these patients from early infancy can do much, it is now thought, to mitigate the disability and prevent the development of deformities. Dr. Ellis hopes, in the clinic, to give parents continuous advice on the handling of babies and preschool children, and also to advise parents of children who have not proved eligible for the school. Indeed, the school is in the process of developing into a centre, with an interest in cerebral palsy at all ages—the clinic advising on babies and young children, the welfare worker examining the difficulties of adolescents, and the school itself providing for children of intermediate age. Later, a class run on the lines of an occupation centre may be arranged for palsied children who are more backward, or mentally subnormal. The school authorities have no wish to corner the cerebral palsy market in the region: much good work is already being done for these patients by family doctors, hospitals, and local-authority clinics. The school, besides doing good work along its own lines, may also become, in time, a coördinating centre for these other services.

1. The address of the school is Hampeth Lodge, Forest Hall, Newcastle upon Tyne.

SALE OF METHYLPENTYNOL

THE council of the Pharmaceutical Society of Great Britain, in a statement issued last week, say that they view with increasing anxiety the publicity given in various newspapers to methylpentynol ('Oblivon') and its uses. While the final place of this drug in therapeutics is still uncertain, the council observe, the dangers of its indiscriminate use or its use in excessive quantities are substantial, and they think that methylpentynol should be available on medical or dental prescription only. The council accordingly advise members of the society to supply the drug only when a prescription is presented.

University of Oxford

On July 17 the following degrees were conferred:

D.M.—M. de G. Gribble, I. M. Shepherd.

B.M.—P. L. C. Monier-Williams, D. G. Craig, P. F. Mead, I. W. Young, P. R. Lane, M. W. P. Nienaber, W. P. E. Exelby, D. H. Neale, A. J. McM. Cavenagh, J. H. Davies, Keith Norcross, W. F. C. Blumer, G. A. W. Sharrard, J. P. Weaver, L. D. Brookes, J. S. R. Harcombe, J. P. H. M. Rae, R. R. Tilleard-Cole, F. D. C. Ford, L. J. Atkinson, Chrystal H. Ashton, Jacqueline B. Lyon, A. E. Cameron, * L. P. H. ffrench-Constant, * M. L. Sommer.

* In absentia.

University of London

Mr. J. B. Kinmonth, reader in surgery at St. Bartholomew's Hospital Medical College, has been appointed to the university chair of surgery at St. Thomas's Hospital Medical School.

Mr. Kinmonth graduated M.B. Lond. from St. Thomas's Hospital in 1938. After holding house-appointments there he served during the late war as a surgical specialist in the R.A.F.V.R. with the rank of wing-commander. In 1941 he took the F.R.C.S. and in 1943 the degree of M.S. After holding a research fellowship at Harvard University he returned to London to take up the post of chief assistant in the surgical unit at Barts, and later he became senior assistant in the surgical unit at St. Thomas's. He returned to Barts as reader in surgery in 1950. He has published papers on arterial surgery, including traumatic arterial spasm and lymphangiography. In 1951 he held an Arris and Gale lecturership and this year a Hunterian professorship at the Royal College of Surgeons.

Queen's University, Belfast

Dr. G. W. A. Dick, a member of the scientific staff of the Medical Research Council, has been appointed to the chair of bacteriology.

Dr. Dick graduated M.B. in the University of Edinburgh in 1938, and the following year he took his B.SC. with first-class honours in pathology. During the late war he served with the R.A.M.C. and became a specialist in pathology with the rank of lieut.-colonel. Later he became a specialist consultant in the United States Public Health Service and in 1949 he took the M.P.H. at Johns Hopkins University. He also served for a time as virologist in the Colonial Medical Research Service before taking up his present post in the department of bacteriology and virus research at the National Institute for Medical Research. He is also one of the secretaries of the Medical Research Council's working party on laboratory research on poliomyelitis. His most recent publications include papers on virus hepatitis and on viruses isolated in Uganda.

Royal Society of Medicine

The Nichols fellowship has been awarded to Dr. Norman Morris for research on pre-eclampsia and essential hypertension in pregnancy.

St. Andrews University

Dr. Alexander Mair, senior lecturer in social medicine in the university, has been appointed to the James Mackenzie chair of public health and social medicine.

He graduated M.B. at Aberdeen University in 1942 and then served in the R.A.M.C. for 4 years. After taking his D.P.H. in 1947 he was appointed lecturer in public health at Aberdeen University, and he took his M.D. with honours before going to Dundee two years ago. Last year he visited universities and medical schools in the United States and Canada, to study advances in the teaching of public health and preventive medicine.

Royal College of Surgeons of England

At a meeting of the council held on July 29, with Sir Harry Platt, the president, in the chair, Prof. V. F. Lambert was admitted to the court of examiners. A Moynihan lectureship was awarded to Dr. Oswaldo P. Campos (Rio de Janeiro). The Hallett prize was awarded jointly to G. S. M. Botha (Cape Town) and J. D. N. Yelland (Queensland), and the Handcock prize was awarded to M. J. A. Britten (Liverpool).

A diploma of fellowship was granted to W. R. O'Flynn, and a fellowship of the faculty of anæsthetists to G. C. Thick.

Licences to practise were conferred upon 111 candidates who have passed the final examination of the Conjoint Board:

Robert Allan, A. S. Alvarez, D. A. Ampofo, P. C. Anderson, Per Apall-Olsen, John Atkins, L. L. Banks, R. G. Bannister, C. J. Barlow, Elizabeth S. M. Barnes, Felix Beck, D. A. Bennett, J. G. Bennett, Sheila I. Berry, R. G. Bird, P. W. Blower, W. R. P. Bourne, Patricia M. Boyd, M. J. A. Britten, Daphne J. Broughton, G. R. Brown, R. M. Burton, G. G. Carmichael, R. A. Carpenter, Gerald Cartmel, J. D. Chard, J. A. Collings-Wells, Anne J. Cour-Palais, Mavis E. Coutts, M. A. Cowan, J. R. Cox, M. C. L. Cox, P. D. Crockatt, R. R. Cundy, E. E. Denman, Doreen J. Dicks, Donald Dobson, W. D. Dolton, Hugh Dovey, P. J. Doyle, E. I. P. Ebosie, Claud Ennin, R. C. O. Eruchalu, D. K. Fairweather, P. Y. N. Forget, P. J. Giffard, B. D. Glaisher, Norman Gold, Geoffrey Gover, G. S. Hall, R. J. Haythopnthwaite, P. N. K. Heyling, A. V. Hollingworth, Gerald Holmes, Rosemary Hulley, J. H. C. Hunt, Hubert Inceman, D. C. Jackson, J. L. James, A. C. Johansson, D. H. Jones, Beatrice K. Jorgensen, J. D. C. Kelly, G. E. King, Nathan Landau, T. L. Landau, E. H. Lanford, W. G. R. M. Laurie, L. J. Lawson, N. G. Lewis, Sheila M. Lightowlers, J. L. Loakes, Mary E. Mackintosh, B. H. Markham, D. H. Mathias, M. T. Moore, Margaret Muller, A. F. Munro, R. C. Nainby-Luxmoore, J. D. Nicholas, Margaret B. B. Norcott, W. S. Ogden, Barbara K. Oliver, D. G. Osmond, Margaret R. Palmer, A. M. Parfitt, P. A. P. Pompa, J. B. Pond, Ahmad Ramzy Rizk, B. H. B. Robinson, A. B. Rolfe, D. J. C. Ross, C. A. Rushmer, Merton Seigleman, Helen L. Shaw, Ezz El Din Shoukry, N. A. Silverston, G. W. T. Smith, Serhij Sochockyj, S. G. Sutton, M. A. Toseland, C. A. M. Walkley, T. J. Walsh, John Waters, D. N. Whitmore, J. T. N. Williams, P. K. Wilson, S. E. A. Wyner, O. J. Zilliacus.

The following diplomas were granted, jointly with the Royal College of Physicians:

D.A.—Fiona M. Acheson, Mari Ainsleigh-Jones, J. B. Allan, J. C. T. Archer, Sachindra Nath Basu, Khurshid Begum, Birendralal Bhattacharjee, J. H. Birch, Bruno Blanckenberg, Angela Blundell, F. X. Borg, D. E. Brown, J. A. Burnett, J. D. K. Burton, Lorna Chippindale, Edward Cody, A. H. Cohen, Barbara W. Cooke, C. C. Crampton, J. R. Cross, John Crow, Pauline M. Daniels, Arnold Danziger, Brenda M. Dempsey, J. R. Duffield, Marjorie J. S. Evans, J. A. Fitzpatrick, Catherine T. Foley, Ellen P. Foley, K. H. Foord, Judith H. Foote, B. G. Forrest, G. C. Foster-Smith, G. G. France, Margaret Fyfe, Norman Garwood, W. S. Hall, J. M. Haughton, Bernard Hayes, V. M. Hercus, P. J. Horsey, J. G. Hudson, D. C. Hughes, Margaret O. Hunt, Ahmed Hussain, Rosemary Huxley-Williams, C. R. Jolly, K. H. Jooste, Z. A. Jordan-Sikorska, R. I. Keen, Robert King, Marcos Krausz, A. W. Laing, Norman Laurie Smith, Josef Lederer, Jacob Levin, T. J. McCaughey, P. M. F. McGarry E. L. Magee, Sheila H. Martin, M. D. Mehta, J. A. K. Meldrum, A. J. Merrifield, Rosemary A. Morrell, W. J. Mostert, Agnes P. Muir, P. J. Myles, K. W. Oldham, June M. Oliver, R. M. B. Penhearow, Elizabeth Primrose, Janet P. Rickard, D. G. B. Riddick, P. J. Roffey, Barbara M. Rowe, W. K. Slack, J. W. Smith, Cecily F. Statham, A. R. Sutherland, Peter Stuart, Venkata Subbaraman, J. A. F. Tobin, J. K. Trotter, F. T. G. Tuffnell, Barbara Ward, Alison A. P. Watson, H. N. S. Wilkinson, Frank Wilson, Bernard Wolfson.

D.L.O.—D. B. Arnott, Charles Aronson, A. K. Bain, Mohamad Ghiasuddin Faruqi, P. W. Head, Herur Hirannia, D. C. James, Dattaram Wamanrao Khot, Khuan Loon Lam, W. F. Leith, Syed Durwaish Mohiuddin, Muhammad Abdul Qayyum, Padmakar Nilkanth Ranade, Mahabishnu Sen, Joseph Siegler, R. D. Stride, J. P. Tonkin, G. K. Vincent, Norman Vincenti, Stanley Whitfield.

D.O.—Wai Kai Chan, E. C. Cowan, J. F. Cullen, D. H. Dave, M. L. Ghate, S. J. Goddard, Abdul Majid Hasan, D. W. Hill, T. M. M. Hurley, W. A. Hyslop, E. J. McCabe, William May, Hari Mohan, B. D. O'Hanlon, R. E. Onwumere, P. D. G. Quirke, Satya Deo Sharma, H. P. Spiro, P. N. Van Soelen, Zena B. Webster.

D.M.R.-D.—C. G. Anderson, D. H. Campbell, P. C. Conlon, R. S. C. Couch, R. I. Green, Francis Mulcahy, G. M. Muller, J. B. J. Murray, G. W. Ritchie, P. D. Sutton, Aaron Woolfson.

D.M.R.-T.—H. J. G. Bloom, David Durbach, H. K. T. Fernando, Marc Geoffroy, K. E. Halnan, Barbara A. Hollis, N. T. Nicol, M. J. O'Halloran, Evan Sherrah-Davies, Chai-Hee Tsao.

D.Phys.Med.—H. W. Balch, L. P. D. Gunewardene.

D.P.H.—Jagri Ram Bhatia, J. F. J. Kelly, J. A. Linden, C. H. Phillips, K. M. Williams, Zygmunt Zubrzycki.

D.T.M. & H.—D. W. Beckett, L. T. Champness, O. F. Conran, Sharadchandra Mukund Deoras, Muhammad Siddiq Fardidi, James Fernandez, Santa Ha-Upala, Inderjit Khosla, J. S. Oakey, G. C. Peter, Mahendra Prasad, Mohammad Kabeer Qureshi-Ul-Hashmi, H. A. J. Reay, E. S. Reed, Chatchvala Siriwann, G. G. Smith, R. M. Vanreenen, K. E. Wardill, Andreas Werner, J. L. Whitby.

D.P.M.—R. W. A. C. Barton, Lorna M. Brierley, Homai Meherji Colabawalla, A. M. Cook, John Evans, G. E. Faulkner, Emily M. Frazer, J. G. Gibson, A. W. Griffiths, Bimalendu Gupta, R. N. T. Higgins, A. R. May, G. A. Nemeth, C. H. Neville-Smith, B. W. Orchard, A. A. Reid, Josephine Rutter, F. G. Tait, J. C. N. Tibbits, John Todd, J. G. O. Wardell-Yerburgh, M. A. T. Waters, Stanley Wiseberg.

D.I.H.—Sudhir Chandra Basu, John Cameron, Jyotirup Chattopadhyay, Maxwell Fitch, Gev Sorabji Godiwalla, F. M. James, Banwari Lall, W. M. McCutcheon, W. S. Millar, P. C. Murray, Satyendra Krishna Sarkar, J. C. Taylor.

D.Path.—F. G. L. Brafield, K. S. Daber, J. T. Duhig, J. A. Shrigley, R. C. Woodcock.

Royal College of Physicians of London

At a comitia of the college held on July 29, with Sir Russell Brain, the president, in the chair, the following fellows were elected officers for the ensuing year:

Censors: Terence East, T. C. Hunt, Ernest Lloyd, J. St. C. Elkington. *Treasurer:* W. G. Barnard. *Registrar:* Sir Harold Boldero. *Harveian librarian:* Sir Charles Dodds. *Assistant registrar:* Alastair Hunter. *Library committee:* K. J. Franklin, F. H. K. Green, A. White Franklin, Geoffrey Keynes. *Finance committee:* W. N. Mann, J. S. Richardson, A. D. C. Bell.

The following were elected examiners:

Panel of examiners for the membership examination: G. Ward, T. L. Hardy, A. H. Douthwaite, Donald Hunter, F. J. Nattrass, J. Forest Smith, L. B. Cole, J. L. Livingstone, M. E. Shaw, E. R. Cullinan, K. E. Harris, Sir Henry Cohen, Robert Platt, A. M. Cooke, E. R. Boland, Robert Coope, J. C. Hawksley, F. P. Lee Lander, J. R. H. Towers, J. G. Scadding, Horace Joules, C. H. Stuart-Harris, F. Avery Jones. *Chemistry:* W. L. G. Gent, PH.D., R. T. Williams, D.SC. *Physics:* H. F. Cook, PH.D., Joseph Rotblat, D.SC. *Materia medica and pharmacology:* W. N. Mann, C. J. Gavey, J. F. Dow, H. C. Stewart, J. M. Robson, R. S. Stacey. *Physiology:* R. J. S. McDowall, W. R. Spurrell. *Anatomy:* Frank Goldby. *Pathology:* F. A. Knott, T. F. Hewer, J. W. Litchfield, L. C. Martin. *Medical anatomy and principles and practice of medicine:* W. G. Wyllie, J. C. Hoyle, W. D. W. Brooks, S. J. Hartfall, R. R. Bomford, Kenneth Robson, Arthur Willcox, Una C. Ledingham, J. F. Stokes, William Phillips, A. D. C. Bell, F. Dudley Hart. *Midwifery and diseases peculiar to women:* Frank Cook, Andrew Claye, J. H. Peel, J. D. S. Flew, R. C. Percival.

Sir Harold Boldero was elected the college representative on the General Medical Council.

The following lecturers were appointed:

Sir John Charles (Harveian orator), Dr. D. J. Williams (Bradshaw), Dr. A. M. Cooke (Lumleian), Dr. G. M. Bull (Goulstonian), Prof. W. M. Arnott (Oliver-Sharpey), Dr. Wilfrid Sheldon (Charles West), Lord Amulree (F. E. Williams), Dr. K. M. A. Perry (Ernestine Henry) all for 1955; Dr. Douthwaite (Croonian), Dr. East (Fitz-Patrick), Dr. R. T. Brain (Watson Smith) for 1956.

The Moxon medal for 1954 was awarded to Dr. J. L. Gamble of Boston for his contributions to the knowledge of the significance of disturbances of electrolyte metabolism in clinical medicine; the Weber-Parkes prize for 1954 was awarded to Mr. H. Morriston Davies for his contributions to the surgical treatment of pulmonary tuberculosis; and the Murchison scholarship was awarded to Dr. E. D. R. Campbell.

The following, having satisfied the censors' board, were admitted to the membership:

John Anderson, M.B. Durh., I. S. Bailey, M.B. Manc., D. C. G. Bett, B.M. Oxfd, J. D. S. Cameron, M.D. Edin., E. D. R. Campbell, B.M. Oxfd, Neil Cardoe, M.B. Durh., E. H. Cooper, M.B. Lond., J. H. Cyriax, M.D. Camb., B. M. Davies, M.B. Wales, A. M. Dawson, M.B. Lond., Stella G. de Silva, L.M.S. Ceylon, J. M. Doyle, M.B. Lond., Z. S. Freeman, M.B. Sydney, J. L. Gibbons, M.B. Durh., A. A. Glynn, M.B. Lond., H. P. B. Harvey, M.B. Sydney, J. M. Hinton, M.B. Lond., W. H. Jopling, L.R.C.P., J. W. Kerr, M.B. Glasg., Anne T. Lambie, M.B. Edin., Fred Lees, M.B. Sheff., June K. Lloyd, M.B. Brist. F. H. Lumb, M.B. Lond., J. D. McCreanor, M.B. N.Z., I. R. McWhinney, M.B. Camb., G. C. Manning, M.B. Camb., E. A. Martin, M.B. Dubl., W. M. I. Maxwell, M.B. Melb., R. G. May, M.B. Camb., J. N. Mickerson, M.D. Lond., J. E. Middleton, B.M. Oxfd, B. E. C. Nordin, M.D. Lond., J. D. W. Pearce, M.D. Edin., C. D. R. Pengelly, M.B. Brist., J. I. S. Robertson, M.B. Lond., Robert Slome, M.D. Cape Town, Jean McI. Smellie, B.M. Oxfd, I. H. Stokoe, M.D. Edin., A. R. Stone, M.B. N.Z., Mary D. Watkins, M.B. Lond., R. H. R. White, M.B. Camb.

Licences to practise were conferred upon H. N. Baylis and V. E. R. Spence, and upon those named in the report of the Royal College of Surgeons above. Diplomas were also conferred upon those named in the report of the Royal College of Surgeons and upon the following:

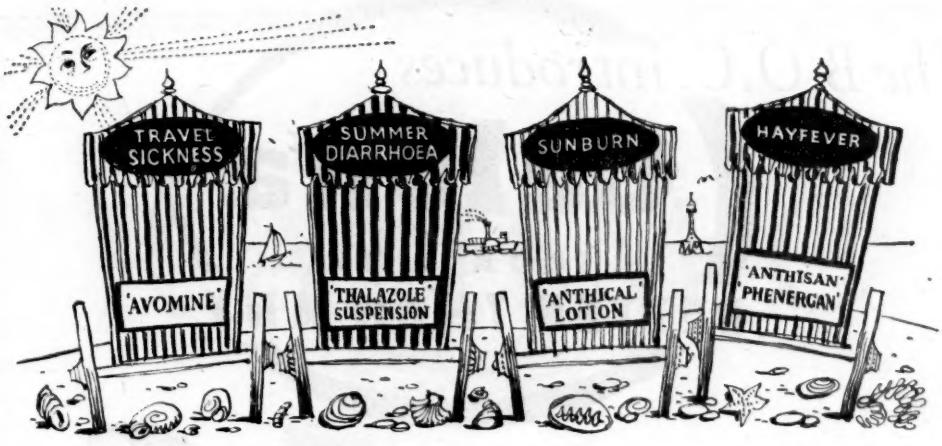
D.C.H.—Elizabeth C. G. Miller.

D.L.O.—J. G. Dickson.

Faculty of Ophthalmologists

The following officers have been elected for 1954–55:

President, Mr. J. H. Doggart; vice-presidents, Dr. John Marshall and Mr. T. Keith Lyle; hon. treasurer, Mr. A. McKie Reid; and hon. secretary, Mr. E. F. King.



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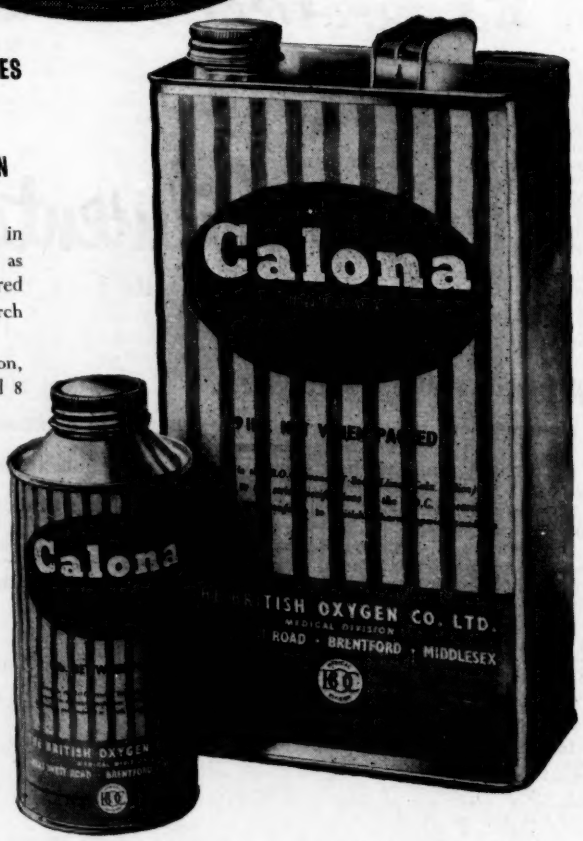

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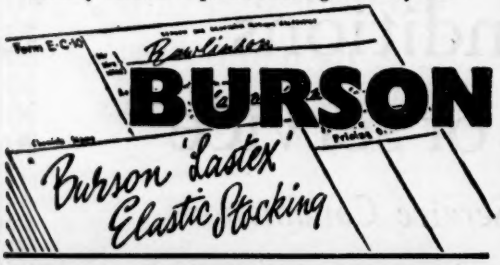

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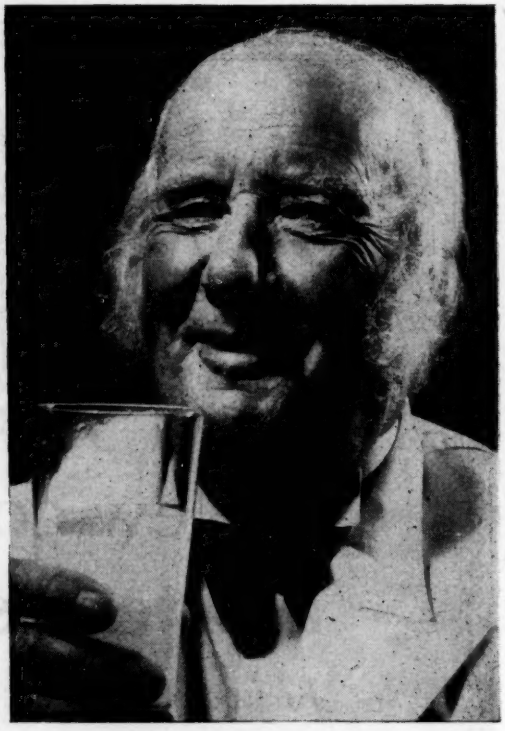

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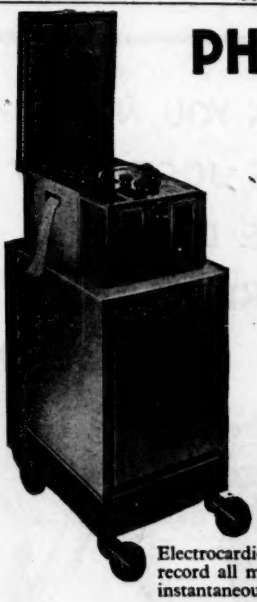

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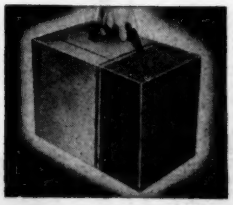

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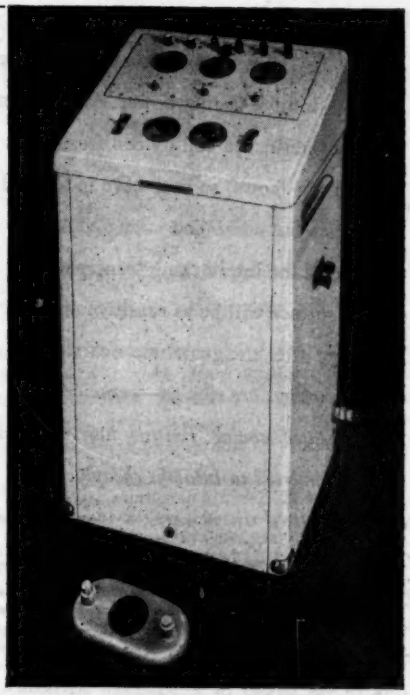

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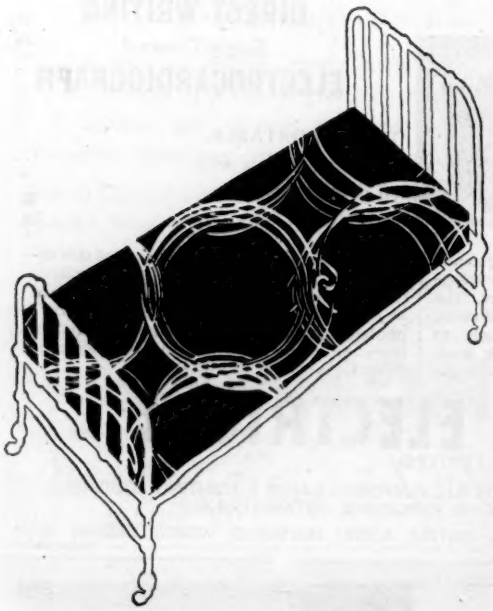

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(*d*) In making the awards preference will be given to younger workers.

(*e*) The work submitted should be unpublished (but may be under consideration for publication) at the closing date for entries.

(*f*) The papers may be in the candidate's own language, but a summary in English not exceeding 500 words must be attached.

(*g*) Where there is one or more co-authors, the name of the leading author should be indicated ; it is to him that the award will normally be made and it will be left to his discretion to share this award appropriately with his co-authors.

G. E. W. WOLSTENHOLME,
Director and Secretary to the Executive Council.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a RESEARCH FELLOW to work on Hydrocephalus and Spina bifida in the Department of Morbid Anatomy. The post is tenable in the first instance for 1 year and the salary will not be less than £1000 p.a., depending on experience and qualifications. Further particulars of the post may be obtained on application to Dr. M. Bodian at the Hospital.

Forms of application which should be returned by 1st October, 1954, are obtainable from the undersigned. Candidates should indicate proposed line of research.

H. F. RUTHERFORD, House Governor and Secretary.
August, 1954.

THE HOSPITALS FOR DISEASES OF THE CHEST. BROMPTON HOSPITAL, S.W.3. Applications are invited for a post of RESEARCH ASSISTANT IN MORBID ANATOMY, Gloyne-Inman Laboratories, Brompton Hospital, tenable for a period of 1 year, in the first instance. Remuneration to be up to a maximum of £1200 p.a., according to the qualifications and experience of the successful candidate.

Applications giving the names of 3 referees to be sent to KENNETH A. F. MILES, House Governor, by 27th August, 1954.

THE WELLCOME RESEARCH LABORATORIES. Applications are invited for an appointment at these laboratories to carry out research in the Department for Virus Diseases, which is being considerably expanded. Work in the first place will be directed to the development of a vaccine against poliomyelitis. Applicants should be graduates with training and, preferably, with previous experience in virology, but a medical or veterinary qualification is not essential.

Applications, giving full personal particulars, including qualifications and experience, should be sent to the Director, Wellcome Research Laboratories, Beckenham, Kent, from whom further details may be obtained.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of DEMONSTRATOR in the Department of Anatomy, at a salary of £600 p.a.

Applications, stating age, qualifications, and experience, should be received not later than 4th September, 1954, by the undersigned, from whom further particulars may be obtained.

STANLEY DUMBELL, Registrar.

THE UNIVERSITY OF MANCHESTER. Applications are invited for the post of ASSISTANT UNIVERSITY MEDICAL OFFICER (full-time) to the Student Health Service. Applicants should have had good clinical experience and should preferably hold a higher medical qualification ; experience with young people would be an advantage. Salary according to qualifications and experience, but not less than £1750 p.a. Membership of F.S.S.U. and children's allowance scheme.

Applications should be sent not later than 10th September, 1954, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a NUFFIELD RESEARCH FELLOWSHIP IN RHEUMATIC DISEASES tenable in the Sheffield Centre for the Investigation and Treatment of Rheumatic Diseases. Stipend in the range £1000–£1500 with annual increments of £100 to £1500. Existing superannuation provision under F.S.S.U. or National Health Service Scheme will be continued. Normal tenure will be 3 years renewable for 2 further years.

Applications (6 copies), should reach the Registrar (from whom further particulars should be obtained) not later than 4th September, 1954.

THE UNIVERSITY OF LEEDS. Department of Pharmacology. Applications are invited for appointment as either DEMONSTRATOR or LECTURER IN PHARMACOLOGY. For a Demonstrator the salary will be within the range £600–£800 if medically qualified or £500–£25–£550 if not medically qualified. For a Lecturer the salary will be on the scale £800–£100–£1300 if medically qualified or £550–£50–£1100 if not medically qualified.

Applications (3 copies), stating date of birth, qualifications, and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 6th September, 1954.

UNIVERSITY OF LEEDS, UNITED LEEDS HOSPITALS. Applications are invited for appointment as SENIOR REGISTRAR AND TUTOR IN OBSTETRICS AND GYNÆCOLOGY, at a salary on the scale £1100–£100–£1400 a year, in the University Department of Obstetrics and Gynecology. The duties will include work at the hospitals with which the University Department is associated and such other duties as may be assigned to him by the Head of the Department. Candidates should hold the M.R.C.O.G. qualification and preferably Fellowship of a Royal College of Surgeons.

Applications (3 copies) stating date of birth, qualifications, details of present and previous appointments with dates, and experience of teaching, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 6th September, 1954.

UNIVERSITY OF EDINBURGH. Department of Surgery. Applications are invited for the post of ASSISTANT for Medical Illustration in the Department of Surgery. Salary scale £395–£450 p.a., with placement according to experience and qualifications.

Applications, stating age, qualifications and full details of training, together with the names of 2 referees, should be lodged with the undersigned not later than 15th September, 1954.

CHARLES H. STEWART, Secretary to the University.

UNIVERSITY OF EDINBURGH. Department of Bacteriology. Applications are invited for the post of LECTURER in the Department of Bacteriology. Salary scale £600–£100–£1000, with placement according to experience and qualifications, and with superannuation benefit and family allowance where applicable. The successful candidate will be expected to take up duty on 1st November, 1954.

Applications, giving the names of 2 referees, should be lodged with the undersigned not later than 31st August, 1954.

CHARLES H. STEWART, Secretary to the University.

UNIVERSITY OF GLASGOW. Applications are invited for a SENIOR LECTURESHIP IN PHYSIOLOGY. Salary scale : £1300–£1800 with a medical qualification ; £1150–£1400 without a medical qualification. Initial salary according to experience and qualifications. F.S.S.U. and family allowance benefits.

Applications (6 copies) should be lodged, not later than 20th August, 1954, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

THE CHRISTIAN MEDICAL COLLEGE, Ludhiana, PUNJAB, INDIA. Wanted immediately for the Department of Physiology a Doctor with postgraduate Degree in Physiology and 3 years teaching experience as Assistant Lecturer with a view to taking over charge of Department. The appointment carries a basic missionary allowance of £190 p.a. (single) and £400 p.a. (married) plus dearness and other allowances. Applications will be welcomed from Men or Women to whom this urgent need constitutes a call to Christian service.

Full particulars from the Secretary, Ludhiana British Fellowship, 12, Queen Anne's-gate, London, S.W.1.

MAKERERE COLLEGE. The University College of EAST AFRICA. Applications are invited for HEADSHIP of the Department of Preventive Medicine. A suitably qualified candidate would be appointed as Professor. Salary according to qualifications and experience (maximum £2250 p.a.), plus £350 temporary cost-of-living allowance. Salary revision in progress. F.S.S.U. Passages paid on appointment, termination and home leave (3 months every 2 years) for member of staff and family. Child allowance £50 p.a. per child (maximum £150 p.a.). Part-furnished quarters 10% of basic salary.

Applications (6 copies), detailing qualifications and experience, and naming 3 referees, to be received by 30th September by Secretary, Inter-University Council for Higher Education in the Colonies, 1, Gordon-square, London, W.C.1, from whom further particulars may be obtained.

DALHOUSIE UNIVERSITY, Halifax, Nova Scotia, CANADA. Applications are invited for the position of ASSOCIATE PROFESSOR AND ASSISTANT PROFESSOR in the Department of Pathology. This is a joint appointment with the Department of Health of the Province of Nova Scotia. Combined services are provided for the teaching hospitals and the provincial diagnostic service in surgical pathology. Salary of Associate $9000–$11,000, Assistant $7500–$8500.

Apply to Professor of Pathology, Dalhousie University, Halifax, Nova Scotia, Canada.

Hospital Services : Senior Appointments

BOLINGBROKE HOSPITAL. Wandsworth Common, S.W.11. Locum RADIOLOGIST, 6 sessions per week, 23rd August–10th September.

Apply Hospital Secretary (BATtersea 2445).

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of DIAGNOSTIC RADIOLOGIST (Consultant), at the Royal Cancer Hospital (5 sessions). Candidates should have considerable experience in this specialty and preference will be given to those prepared to undertake research into the application of modern physics to diagnostic radiology.

Applications (12 copies), quoting age, education, experience, and giving the names of 3 referees, to reach the House Governor by 31st August.

ST. MARK'S HOSPITAL, City-road, E.C.1. Consultant SURGEON required for 4 sessions per week. Post vacant 10th October.

Applications, stating age, qualifications, experience, names of 3 referees, to Secretary, Board of Governors, Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 31st August.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Newcastle upon Tyne Hospital Management Committee (Newcastle Eye Hospital—34 Beds; Walker Eye Hospital—21 Beds)

ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer status) required for hospitals in the Group. The appointee will have special responsibility under the Consultant Ophthalmologists at the Walker Hospital and will be required to live near it, but will also work as required at the Newcastle Eye Hospital and elsewhere. Further particulars may be obtained from the Senior Consultant Ophthalmologist, Eye Hospital, St. Mary's-place, Newcastle upon Tyne.

Darlington, Northallerton and South West Durham Hospital Management Committees (Main hospitals—Darlington Memorial and Hundens Unit—300 Beds (including 20 eye beds); Friarage Hospital, Northallerton—300 Beds; Bishop Auckland General Hospital—300 Beds) Population 300,000

ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer status) required for hospitals in the Groups. Further particulars may be obtained from the Consultant Ophthalmologist, Memorial Hospital, Darlington.

Salary scale £1500–£1950 whole-time, pro rata part-time.

Darlington Hospital Management Committee (Main hospital: Memorial Hospital, Darlington)

SENIOR CASUALTY OFFICER (whole-time). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Senior Orthopædic Surgeon and of the Senior General Surgeons, to organise the casualty work throughout the Group; the main centre at present being at the Memorial Hospital, Darlington. A flat, furnished or unfurnished, may be available on a rental basis.

South West Durham Hospital Management Committee (Main hospital: General Hospital, Bishop Auckland)

SENIOR CASUALTY OFFICER (whole-time). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Orthopædic Surgeon and General Surgeons, to organise the casualty work throughout the Group; the main centre being at the Bishop Auckland General Hospital. A semi-detached 3-bedroomed house adjoining the Hospital available on a rental basis.

Salary within the range £1500–£50–£1950 or £1400–£50–£1950 according to age.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIST (Senior Hospital Medical Officer) for 6 half-days a week. Harefield Hospital, Harefield (636 Beds)—Wednesdays A.M. and Tuesdays, Wednesdays, and Fridays P.M. Uxbridge Cottage Hospital (27 Beds)—Fridays A.M., and Queen Victoria Hospital, Hanwell (17 Beds)—Tuesdays A.M. Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th September, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Applications are invited from medical practitioners for the appointment of ASSISTANT SENIOR MEDICAL OFFICER on the staff of the Senior Administrative Medical Officer at the Board's Headquarters, Harrogate, at a salary range of £1500–£75(4)–£100(1)–£1900 p.a. for duties in connection with the organisation and planning of the Hospital and Specialist Services of the Region. Previous experience of medical administration in the Hospital and/or Health Service would be considered an advantage. The post is subject to the National Health Service (Superannuation) Regulations, 1950/2, and may be terminated by 3 months notice on either side.

Applications, with full details of qualifications and experience, together with the names of 3 referees, to the Secretary to the Board, Park-parade, Harrogate, by 21st August, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT (9 sessions per week) in Pathology for duties at hospitals in the Bradford Area. The person appointed to the post will be Head of the Department of Pathology in Bradford and, as such, will be required to organise the Pathological Services for the Bradford hospitals, and reside in Bradford.

Applications (12 copies), stating age, qualifications, and details of appointments held, showing dates, with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 4th September, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Appointment of Whole-time ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer scale) for duties mainly at Pinderfields General Hospital and to be resident at Wakefield.

Applications (12 copies), stating age, qualifications, and details of appointments held (showing dates), with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 14th August, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) required from 1st September, 1954, for duties at De la Pole Hospital, Willerby, East Yorkshire, for a period of 1 month in the first instance.

Applications, stating age, qualifications and details of previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary to the Board, Park-parade, Harrogate.

LIVERPOOL REGIONAL HOSPITAL BOARD. East LIVERPOOL AREA. Applications are invited for the whole-time post of ASSISTANT RADIOLOGIST with duties in the East Liverpool Area mainly at Broadgreen Hospital. Applicants should possess a Diploma in Radiology and have had wide experience in radiology. Salary £1500 (at age 32)–£50–£1950 p.a.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 28th August, 1954.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time post of TUBERCULOSIS PHYSICIAN AND MEDICAL OFFICER in charge of a Mobile Mass Radiography Unit (Senior Hospital Medical Officer) based on Ladywell Hospital, Salford. Appointee will also have clinical duties under general guidance of a Consultant at chest clinics, &c., in the Salford area. Previous experience of chest diseases and M.M.R. required.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 18th August, 1954.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time post of SENIOR HOSPITAL MEDICAL OFFICER in Anæsthetics at the Stornoway Hospitals. Duties are mainly at the Lewis Hospital, where a rented house is available for the officer.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 25th August, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT RADIOLOGIST based at the Western Infirmary, Glasgow, and with duties elsewhere in the Region as may be required. Salary on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT ASSISTANT PHYSICIAN to the Lincoln No. 1 Hospital Management Committee Group. The person appointed will have day-to-day care of 42 infectious diseases beds at the Lincoln Isolation and Chest Hospital, but will be mainly occupied with geriatric duties at the St. George's Hospital, Lincoln (102 Beds). Salary £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th August.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum ANÆSTHETIST required until 3rd October at Scunthorpe and District War Memorial Hospital. Remuneration at rate of 31½ guineas per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST required for the Grimsby General Hospital and Louth County Infirmary. Candidates should possess the D.A. Salary scale £1500–£50–£1950.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Completed forms to be returned by 4th September, 1954.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT E.N.T. SURGEON (3 half-days per week) for the Redhill (Surrey) Group including duties at Dorking, Crawley, and Horsham Hospitals.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1.), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 4th September, 1954. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires 2 Whole-time ASSISTANT PSYCHIATRISTS (Senior Hospital Medical Officer grade) at Long Grove Hospital, Epsom, Surrey. Candidates should possess D.P.M. and preferably a higher medical qualification, and should have wide experience of all aspects of psychiatry.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 28th August, 1954. Applicants may visit Hospital by local arrangement.

WELSH REGIONAL HOSPITAL BOARD.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), St. David's Hospital, Carmarthen (950 Beds). All modern methods of treatment, active outpatient clinics. House available.

ASSISTANT TRAUMATIC SURGEON (Senior Hospital Medical Officer), Morriston Hospital, near Swansea (501 Beds). Successful candidate will work under direction of visiting Consultants.

Applications (12 copies) to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days of appearance of advertisement.

IRELAND. ST. JOHN OF GOD PRIVATE PSYCHIATRIC HOSPITAL, STILLORGAN, CO. DUBLIN, IRELAND. (Conducted by Brothers of St. John of God. Hospital contains 135 Beds.) Applications are invited for the position of RESIDENT MEDICAL DIRECTOR at above Hospital. Candidates should be of Consultant status and possess the highest qualifications.

Application forms with particulars sent on request. Completed forms to be returned not later than 31st August, 1954, to Brother Secretary, St. John of God Private Psychiatric Hospital, Stillorgan, co. Dublin, Ireland.

SOUTH AFRICAN BLOOD TRANSFUSION SERVICE. Applications are invited from registered medical practitioners with experience in blood-transfusion and bacteriology for the position of SEROLOGIST of the South African Blood Transfusion Service. The appointment will be made on the salary scale £1700–£100–£2400 p.a., but in determining the commencing salary cognisance may be taken of previous experience and special qualification. The successful applicant will be expected to assume duty in Johannesburg on 1st November, 1954. Membership of the Service's Staff Provident Fund is a condition of employment.

Applications, stating full details of age, qualifications, experience, marital status, &c., should be submitted in writing to the Secretary, South African Blood Transfusion Service, P.O. Box 9326, Johannesburg, so as to be received not later than 15th August, 1954. The Medical Director of the Service will be in London early in September, 1954, to interview applicants at a time and place to be advised.

Hospital Services : Junior Appointments

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (medical), whole-time, non-resident, required at above Hospital for 1 year in the first instance from 16th October, 1954.

Forms of application from the Secretary, Battersea and Putney Group Hospital Management Committee, 54, Upper Richmond-road, S.W.15, to whom they should be returned within 14 days.

BROOK GENERAL HOSPITAL, Shooters Hill-road, Woolwich, S.E.18. HOUSE PHYSICIAN (Infectious Diseases Unit). This Unit provides excellent experience and is 1 of the Regional Centres for the treatment of bulbar poliomyelitis. 6 months appointment, salary £525 p.a., less £125 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

CHARING CROSS HOSPITAL GROUP. Registrar in Anæsthesia (full-time), resident at Kingsbury Maternity Hospital, with liability for duties at other hospitals in the Group. The post is tenable for 1 year in the first instance. Candidates must hold the Diploma in Anæsthesia.

Application forms, obtainable from the undersigned, should be returned by 23rd August, 1954.

FRANK HART, Secretary to the Board.

EASTERN HOSPITAL (Fevers), Homerton-grove, London, E.9. Applications, for the post of SENIOR HOUSE OFFICER (deduction £130 p.a. for residence), should be sent to the Group Secretary, Hackney Hospital, London, E.9, with copies of 3 testimonials. The post is for 1 year in the first instance. duties of successful candidate may include some work in the Chest Unit.

GERMAN HOSPITAL, Dalston, E.8. (General—157 Beds.) Applications are invited from registered medical practitioners for the 6 months appointment of HOUSE SURGEON now vacant and should be sent to the Group Secretary, Hackney Hospital, London, E.9, quoting reference GH/HS.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the posts of HOUSE OFFICERS (casualty) (1 with additional duties in the Skin Department and 1 with additional duties in the E.N.T. Department), should be sent as soon as possible to the Group Secretary at the above address.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st October, 1954, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatients Department, and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 21st August.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR REGISTRAR to the E.N.T. Department, vacant on 26th October, 1954. Candidates should be Fellows of the Royal College of Surgeons.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the House Governor by 8th September, 1954. H. BRIERLEY, House Governor.

KING EDWARD MEMORIAL HOSPITAL, Ealing, and CLAYPONDS HOSPITAL, SOUTH EALING. SOUTH WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE SURGEON required mainly for E.N.T. duties but with some general work at King Edward Memorial Hospital and Clayponds Hospital. Resident at Clayponds Hospital.

Apply in writing, stating age, nationality, qualifications with dates, and previous experience, together with names of 2 referees, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 17th August, 1954.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) HOUSE PHYSICIAN (pre-registration or first, second or third) required for 6 months commencing 8th September, 1954.

Application forms may be obtained from Physician-Superintendent and should be returned by 18th August with copies of 3 testimonials.

MILE END HOSPITAL, Bancroft-road, E.1. House OFFICER (second or third—obstetrics). Post recognised in obstetrics for M.R.C.O.G. required for 6 months commencing 15th September, 1954.

Application forms, which may be obtained from Physician-Superintendent, to be returned by 14th August, 1954.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) RESIDENT OBSTETRIC HOUSE SURGEON (not pre-registration) required for 6 months from 1st September. Post recognised for M.R.C.O.G.

Apply with copy testimonials to Group Secretary, Hackney Hospital, London, E.9, quoting MH/HO.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Pre-registration RESIDENT OBSTETRIC HOUSE SURGEON (second post) required for 6 months from 1st September. Post recognised for M.R.C.O.G.

Apply with copy testimonials to Group Secretary, Hackney Hospital, London, E.9, quoting MH/PHO.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of ASSISTANT HOUSE PHYSICIAN (non-resident) at The National Hospital, Queen-square, W.C.1. This post carries the grade of Senior House Officer. The appointment will be for 6 months.

Applications, with names of 3 referees, to be sent to the undersigned not later than 21st August, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD AND BOARD OF GOVERNORS OF THE LONDON HOSPITAL. Senior Registrar appointment under a joint training scheme.

SENIOR REGISTRAR in Pædiatrics (non-resident), Queen Elizabeth Hospital for Children, Hackney-road, E.2, and The London Hospital, E.1.

Appointment subject to review after 1 year.

Applications in triplicate, with names of 2 referees, to Secretary, North East Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 21st August, 1954.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) REGISTRAR in Psychiatry (resident or non-resident), Severalls Hospital, Colchester.

(2) REGISTRAR in Psychiatry (non-resident if married), Runwell Hospital, near Wickford. Post recognised for D.P.M.

(3) REGISTRAR in Psychiatry (resident or non-resident), St. Clement's Hospital, Bow, E.3. Duties in Psychiatric Unit of 24 observation beds ; and 36 beds for neuroses and early psychoses. Unit run in conjunction with The London and Claybury Hospitals. Recognised for D.P.M.

(4) REGISTRAR in Psychiatry (non-resident), Whipps Cross and Langthorne Hospitals, E.11. Residence within easy access of the hospitals.

(5) REGISTRAR in Obstetrics and Gynæcology (resident), Forest Gate Hospital, E.7. Post recognised for M.R.C.O.G.

(6) REGISTRAR in Obstetrics (resident), Thorpe Coombe Maternity Hospital, E.17. Post recognised for M.R.C.O.G.

(7) ANÆSTHETIC REGISTRAR (resident or non-resident near hospital), King George Hospital, Ilford. Application being made for recognition for F.F.A.R.C.S.

(8) ANÆSTHETIC REGISTRAR (resident or non-resident), Hackney Hospital, E.9. Post recognised for F.F.A.R.C.S. and D.A. The appointment offers wide experience of anæsthesia and opportunities for studying for higher qualifications.

(9) E.N.T. REGISTRAR (resident at Hackney Hospital), Hackney Group of hospitals.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 21st August, 1954.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Locum SENIOR REGISTRAR in Radiology required for 1 week commencing 30th August to work under the direction of Visiting Consultant Radiologist. Qualification in specialty essential. Very busy department, work large and varied.

Applications, stating age, nationality, qualifications, experience, to Secretary of Hospital immediately.

ROYAL EYE HOSPITAL. King's College Hospital GROUP. Applications are invited for the post of HOUSE SURGEON from 1st October, 1954. Salary in accordance with terms and conditions of service for Senior House Officers.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's Circus, S.E.1, by 21st August, 1954.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT ANÆSTHETIST, for a period of 6 months, vacant 30th September, 1954. Post recognised for F.F.A.R.C.S.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group 4), to be returned by 1st September, 1954.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICER. This appointment will be made for 2 periods of 6 months commencing 1st October, 1954, and 1st May, 1955 (leave intervening). First appointment as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned, with copies of not more than 3 testimonials, on or before 23rd August, 1954.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the Anæsthetic Department, recognised within Senior Registrar establishment. Duties to commence on 1st November, 1954. The post is non-resident and for 1 year in the first instance. Salary in accordance with the scale laid down by the Ministry of Health for Senior Registrars.

Applications, together with the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 21st August, 1954.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, London, W.C.1. The appointment is full-time, resident, for 6 months. Duties to commence on 1st October, 1954. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 30th August, 1954

ROYAL FREE HOSPITAL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER to the Radiotherapy Department. Applicants should be registered medical practitioners, and the appointment is suitable for a candidate doing a postgraduate course in radiotherapy. The appointment is for a period of 1 year, duties to commence on 1st October, 1954. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, London, W.C.1, to whom they should be returned not later than 30th August, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SECOND RESIDENT ANÆSTHETIST (Senior House Officer grade), vacant 6th September, 1954. Appointment recognised for D.A.

Applications to be sent to the Hospital Secretary by 14th August, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics), vacant 30th August, 1954. Occasional casualty duties involved. Recognised for F.R.C.S.

Applications to be sent to the Hospital Secretary by 14th August.

REGIONAL NEUROSURGICAL CENTRE. (50 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery), vacant early September. The post, which is recognised for F.R.C.S., also provides excellent opportunity for training in neurology. Salary £745 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. North East METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Medicine, to be held for 2 years at St. Bartholomew's Hospital and for 1 year at The Metropolitan Hospital and for 1 year in a special Unit and/or on research work, subject to annual re-election.

Applications, with the names of 3 referees, should be submitted to the undersigned by Wednesday, 18th August, 1954.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, E.C.1.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of Whole-time REGISTRAR in the Orthopædic Department. The appointment will be for 1 year in the first place with eligibility for re-election to a maximum of 3 years.

Applications, giving the names of 3 referees, should be submitted to the undersigned on or before 18th August, 1954.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited from fully registered practitioners for the post of RESIDENT MEDICAL OFFICER (House Officer grade) at the Alexandra Hospital for Children, Stockwood Park, Luton. This Hospital is mainly for long-stay orthopædic cases, though there are some pædiatric cases. Commencing date can be arranged.

Applications, with copies of 3 testimonials, should be submitted to the undersigned by 20th August, 1954.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. STEPHEN'S HOSPITAL, Fulham-road, S.W.10. OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (resident), vacancy early September, 1954. Post recognised for D.Obst.R.C.O.G.

Applications, naming 2 referees, to Medical Superintendent.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of REGISTRAR to the Fever and Tuberculosis Units at the Grove Hospital, S.W.17. The successful candidate will be required to take up his duties as soon after 1st September as possible. The appointment is for 1 year in the first instance.

Applications, giving details of age, education, qualifications, experience, and the names of 2 referees, should be received by the undersigned not later than 17th August, 1954.

P. H. CONSTABLE, House Governor.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT ASSISTANT CLINICAL PATHOLOGIST in the grade of Senior House Officer. Previous experience in laboratory work is not essential, but applicants should have held a clinical appointment. The appointment is for 1 year with effect from 26th September, 1954, or as soon after that date as possible.

Applications, giving details of age, education, qualifications, experience, and the names of 2 referees, should be received by the undersigned not later than 21st August, 1954.

P. H. CONSTABLE, House Governor.

ST. JAMES' HOSPITAL, Sarsfeld-road, Balham, S.W.12. Locum SENIOR REGISTRAR required in Pathological Department. Post vacant August and September.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address within 7 days.

ST. JAMES' HOSPITAL, Sarsfeld-road, Balham, S.W.12. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. WANDSWORTH HOSPITAL GROUP. Applications are invited for the post of SENIOR REGISTRAR (general medicine), vacant 1st October.

Application forms (send stamped addressed foolscap envelope) obtainable from Group Secretary at the above address to be completed and returned by 18th August.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of Part-time CLINICAL ASSISTANT to the Physiotherapy Department at St. Mary's Hospital (4 notional half-days per week). The grading of this post is Registrar and the successful applicant will be required to take up his duties as soon as possible; the appointment will be for a first period of 12 months, the holder being eligible for reappointment.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 25th August, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of RESIDENT MEDICAL SUPERINTENDENT, graded Junior Hospital Medical Officer (the Senior Resident Medical Officer of the Hospital). The appointment is for a first period of 12 months, with effect from 1st October, 1954, and the holder is eligible for reappointment for a second and third term. The holder of this appointment is entitled to retain fees in respect of General Practitioner's Services, given to members of the Staff who are on the Medical Superintendent's "List."

Applications, stating nationality, date of birth, permanent address, qualifications and date of registration, details of previous appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 16th August, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of REGISTRAR to the Pædiatric Department at St. Mary's Hospital. Previous experience in pædiatrics is necessary; preference will be given to candidates holding the M.R.C.P. The successful candidate will be required to undertake duties in the Pædiatric Unit at St. Mary's Hospital as well as at the Constituent Children's Hospitals. The appointment will be for a first period of 12 months, with effect from a date to be arranged, the holder being eligible for reappointment; remuneration at Registrar rate. The successful applicant may be eligible to participate in an exchange scheme with the Children's Medical Centre, Boston (Harvard University).

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 17th August, 1954.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior HOUSE OFFICER (Casualty Department), vacant now. Recognised for F.R.C.S. Appointment for 6 months in first instance and may be renewed for further period. Salary £745 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies on 15th November, 1954, for the following Senior House Officers:—

HOUSE PHYSICIAN.

HOUSE SURGEON to the Orthopædic and Plastic Departments.

Further particulars and form of application, which must be returned not later than Monday, 6th September, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th October, 1954, for a MEDICAL REGISTRAR AND PATHOLOGIST (Senior Registrar).

Further particulars including the possibility of a period of secondment to Uganda, can be obtained from the undersigned. A form of application will also be sent, which must be returned not later than Monday, 6th September, 1954.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time ORTHOPÆDIC REGISTRAR to attend for 1 outpatient session per week on Monday afternoons (Registrar grade).

Forms of application, which should be returned by Monday, 6th September, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. HOUSE SURGEON (general and genito-urinary) required 1st October.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 21st August.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR HOUSE OFFICER to E.N.T. Department for 1 year from 10th October or possibly earlier.

Applications (6 copies), with names of 2 referees, to House Governor by 24th August.

ABERDARE GENERAL HOSPITAL, Aberdare. (102 Beds.) MERTHYR AND ABERDARE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER. Duties include those in general surgery, general medicine, gynæcology, obstetrics and pædiatrics. Vacancy September. Salary £745 p.a. less emoluments.

Applications, stating age, qualifications, &c., together with copies of 2 recent testimonials, to Group Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale, less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOSPITAL. (Mental—1350 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Psychiatry (resident or non-resident). All forms of treatment carried out and outpatient clinics held at the local general hospitals. Facilities for research work and for attendance at D.P.M. and other courses in London. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Medical Superintendent, Three Counties Hospital, Arlesey, Beds, by 1st September 1954.

AYLESBURY, BUCKINGHAMSHIRE. TINDAL GENERAL HOSPITAL. (260 Beds.)

HOUSE SURGEONS (Male or Female). The posts offer wide experience of general surgery with operative practice; recognised for F.R.C.S. The acute Surgical Unit consists of 95 Beds. No casualty department.

HOUSE SURGEON (E.N.T.), Male or Female. New department with high turnover and 4 outpatient clinics weekly. Recognised for D.L.O. and F.R.C.S. No casualty department.

Vacant 1st October. Pre-registration posts, but registered practitioners invited to apply.

Please apply, with copies of 2 testimonials, to the Administrative Officer, as soon as possible.

BEXHILL HOSPITAL, Bexhill. (62 Beds.) 2 House SURGEONS. Posts vacant now. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BIRKENHEAD. ST. CATHERINE'S HOSPITAL. (459 Bedded General Hospital.) BIRKENHEAD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics. Post approved for D.A. examination and offers excellent experience. Tenable from 1st October.

Apply, stating age, qualifications, experience, with names of 2 referees, to Secretary above Committee, St. James' Hospital, Birkenhead.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. Applications invited for post of SECOND RESIDENT ANÆSTHETIST (Senior House Officer). There are 3 Consultant Anæsthetists and training is given in modern methods of anæsthesia. Ample opportunity for study. Previous experience not essential.

Applications, with full details, naming 2 referees, to Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit, vacant 1st October, 1954. The appointment is recognised for the M.R.C.O.G.

Application forms obtainable from the House Governor at the above address, to be returned not later than 17th August, 1954.

G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of REGISTRAR in Radiotherapy (non-resident), Registrar grade, for duties at the Radiotherapy Centre of the United Birmingham Hospitals. The post is tenable for 1 year in the first instance. Candidates should have Part I of the appropriate diploma and have had practical experience in radiotherapy.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned to him not later than 4th September, 1954.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) in the Department of Bacteriology and Clinical Pathology at the General Hospital. The appointment is tenable for 12 months.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. HEATHFIELD ROAD MATERNITY HOSPITAL, 134, Heathfield-road, BIRMINGHAM, 19. OBSTETRIC HOUSE SURGEON required on 1st October, 1954. Preference given to candidates with previous medical and surgical experience. 50-Bed Maternity Unit with 18-Cot Premature Baby Unit attached. Large Ante-natal Department. Appointment recognised for D.Obst.R.C.O.G.

Detailed applications, with copies of 3 recent testimonials, to Hospital Secretary, Marston Green Maternity Hospital, Berwicks-lane, Marston Green, near Birmingham.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29

REGISTRAR in Pathology for Birmingham Accident Hospital and Rehabilitation Centre (215 Beds). Experience in specialty essential. Possession of higher qualification an advantage. Resident or non-resident.

(2) Shrewsbury Group Hospital Management Committee, Royal Salop Infirmary, Shrewsbury

(*a*) Whole-time REGISTRAR in Psychiatry for Shelton Hospital Shrewsbury (1039 Beds). Hospital recognised for D.P.M. Opportunities for outpatient clinic work. Single accommodation. General hospital experience an advantage.

(*b*) REGISTRAR in Radiology (radiodiagnosis), for Shrewsbury Group and Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry. Resident or non-resident.

(3) South Warwickshire Hospital Group, 87, Radford-road, Leamington Spa

REGISTRAR in Pædiatrics. Duties at Warwick Hospital (includes main Pædiatric Centre), Stratford Children's Hospital and other hospitals in Leamington and Stratford-on-Avon area. Non-resident. Experience in specialty desirable.

Application forms from Group Secretaries, to be returned before 23rd August, 1954. Candidates may visit hospitals.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

The Royal Infirmary, Bolton (237 Beds)

RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Tenable for 12 months and recognised for F.R.C.S.

RESIDENT HOUSE SURGEON for general surgical duties. Tenable for 6 months and recognised under the Pre-registration Service Scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent immediately to—

H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BRADFORD ROYAL INFIRMARY.

SENIOR HOUSE SURGEON (Thoracic Unit), vacant 26th August. Salary £745 p.a., less £150 p.a. residential emoluments.

HOUSE OFFICER (anæsthetics), vacant now. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience.

HOUSE SURGEON (general), vacant 1st August. Recognised for F.R.C.S. and pre-registration purposes.

Salary for either of above 2 posts £425–£525 p.a., less £125 p.a. residential emoluments.

Applications for any of above posts, stating age, experience, nationality and qualifications with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S HOSPITAL.

SENIOR HOUSE OFFICER (anæsthetics), vacant 1st September. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience. Salary £745 p.a., less £150 p.a. residential emoluments.

HOUSE PHYSICIANS (2), vacant 1st August. Recognised for pre-registration purposes.

HOUSE SURGEON (general and plastic), vacant 1st August. Recognised for F.R.C.S. and pre-registration purposes.

HOUSE OFFICER (anæsthetics), vacant now. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience.

Salary for each of above 3 posts £425–£525 p.a., less £125 p.a. residential emoluments.

Applications for any of above posts, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S MATERNITY HOSPITAL. HOUSE OFFICER (obstetrics/gynæcology), vacant 8th August. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD CHILDREN'S HOSPITAL. Senior House OFFICER (Male or Female), vacant 22nd September. Recognised for D.C.H. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRENTWOOD CHEST CLINIC, High Wood Hospital, BRENTWOOD, ESSEX. Part-time MEDICAL OFFICER required, 1 General Practitioner session weekly, Wednesday afternoons, due to expansion of work.

Apply to Chest Physician, from whom further details may be obtained.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ROYAL VICTORIA HOSPITAL, WEST-BOURNE, HANTS. Applications are invited for the appointment of HOUSE SURGEON for E.N.T. and ophthalmic duties. In addition to duties at the above Hospital, the successful candidate will be required to assist in the E.N.T. outpatient clinics at the Royal Victoria Hospital, Bournemouth and Poole General Hospital. The appointment is recognised for the D.O. and D.L.O. Diplomas but not for pre-registration purposes.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Bournemouth.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road, BRIGHTON, 1. (129 Beds and Cots.) SENIOR HOUSE OFFICER, vacant 6th September, 1954. Candidates should have experience in pædiatrics (including surgery). Recognised for D.C.H.

Applications, stating usual particulars, with copies of 2 testimonials and names of 2 referees, to the Administrative Officer not later than 17th August, 1954.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. THORACIC SURGERY DEPARTMENT. HOUSE SURGEON required in the above Department, which is the regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications, with full particulars, should be addressed to the Group Secretary, Frenchay Hospital, Bristol, quoting "Thoracic."

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department, vacant about end of August, 1954. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol. Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN in the Infectious Diseases Department (350 Beds) of this Hospital. The Hospital contains a major Poliomyelitis Unit, a Tuberculous Meningitis Treatment Centre and offers wide experience in acute medicine. Salary and conditions on Junior Hospital Medical Officer scale (subject to a residential deduction of £135 p.a.). Previous fever experience essential. Post vacant October, 1954.

Applications, stating age, qualifications, &c., to the Resident Physician, Ham Green Hospital, Pill, near Bristol.

BROMLEY HOSPITAL, Bromley, Kent. Officer-in-charge Casualty Department (Senior House Officer) required immediately. Facilities to widen experience with the surgical firms of the Hospital. Appointment for 6 or 12 months. Non-resident if necessary. Deduction for residence £150 p.a.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent.

BURTON-ON-TRENT GENERAL INFIRMARY. (251 Beds.) RESIDENT HOUSE SURGEON required for General Surgical Unit. Designated for Pre-registration Service. The Hospital is recognised for the F.R.C.S.

Applications, with full details, naming 2 referees, should be sent to the Secretary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Medical REGISTRAR, vacant 2nd October for 1 year in the first instance, reviewable annually.

Apply, with full particulars, and names of 3 referees, to Secretary, by 20th August. Interviews on 17th September.

CARDIFF. GLAN ELY HOSPITAL, Fairwater. Cardiff HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident), required at above Hospital (240 Beds) for treatment of pulmonary (Thoracic Unit) and all forms of non-pulmonary tuberculosis.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) RESIDENT SENIOR HOUSE OFFICER (casualty) required.

Applications, giving details of qualifications and experience and names of 3 referees, to the Group Secretary, Sandford-road, Cheltenham.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Applications are invited for the appointment of HOUSE PHYSICIAN (pre-registration). The post is resident and will be vacant at the beginning of September. Salary and conditions of service in accordance with the National Health Service regulations.

Applications, together with 2 testimonials, should be sent to STANLEY T. DAVIS, Secretary.

General Hospital, Cheltenham.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SUR-GERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) 2 SENIOR HOUSE OFFICERS in Plastic Surgery required, 1 towards the end of August and the other in September. Previous experience in specialty not essential. The successful candidates will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and posts provide extensive experience. There is also a Senior House Officer in Orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHESTERFIELD HOSPITAL MANAGEMENT COM-MITTEE. Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients) and Scarsdale Hospital, Chesterfield. Salary scale £775–£50–£1075 p.a.

Apply, M. H. BOONE, Secretary, at Chesterfield Royal Hospital.

CHESTERFIELD ROYAL HOSPITAL. Resident Casualty OFFICER (pre-registration grade, or Senior House Officer if person appointed has sufficient experience), required at above Hospital immediately. National salary and conditions. The Casualty Department includes 2 Junior and 1 Senior Casualty Officers, and the post is recognised for F.R.C.S. training. Duties are primarily in the Casualty Department, but by mutual arrangement 1 Casualty Officer performs duties in the Accident and Orthopædic Department, so that opportunities occur for all 3 officers to gain experience in that specialty.

Apply in detail, with copies of recent testimonials, to—

M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHESTER (near). MEADOWSLEA HOSPITAL. Wrex-HAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident). Salary £775–£1075 p.a., less recognised charge for services provided by Hospital. The appointed candidate will be a member of a Chest team covering a wide area in North Wales with excellent opportunities for experience in Hospital and Chest Clinic Practice. Applications from ex-patients will be welcomed. A flat is available for the successful candidate.

Applications, stating age, qualifications, experience, together with the names of 2 referees, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, within 14 days.

COVENTRY NO. 20 GROUP HOSPITAL MANAGE-MENT COMMITTEE invite applications for the following posts :—

Coventry and Warwickshire Hospital (354 Beds)

(1) SENIOR HOUSE OFFICER (casualty), vacant now. Recognised for F.R.C.S.

(2) SENIOR HOUSE OFFICER (anæsthetics), vacant now. Duties at Coventry and Warwickshire Hospital (230 surgical beds) and Gulson Hospital (114 surgical beds). Excellent experience in all types of general anæsthetics. Recognised for F.F.A.R.C.S. Resident.

Hospital of St. Cross, Rugby (152 Beds)

(3) CASUALTY AND ACCIDENT SURGEON, vacant now. To include duties in Orthopædic Department. Salary £775–£1075 p.a. Resident.

Applications to the Secretary, No. 20 Group Hospital Management Committee, Stoney Stanton-road, Coventry.

CROYDON GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at General Hospital (200 Beds) as from 1st September (post resident or non-resident). Candidates should be experienced in surgery and possession of higher surgical qualifications an advantage.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned by 20th August.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House PHYSICIAN (pre-registration post) for period of 6 months from 1st September.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER. This is a joint post between Hundens Unit and East Haven Hospitals, serving E.N.T. ophthalmic, infectious diseases, chest and chronic sick. Good experience with responsibility for suitable candidate. Post resident at Hundens Unit (single accommodation) and is for 4 years with option of reappointment. Post vacant September. Salary £775–£50–£1075 p.a.

Apply with full particulars and 3 names for reference to the Group Secretary, Darlington Memorial Hospital.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (395 Beds. Hospital recognised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (ophthalmology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th August, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DORKING GENERAL HOSPITAL, Horsham-road, Dork-ING. (234 Beds.) REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical), now vacant. Excellent general surgical experience.

Apply to the Medical Superintendent.

DOVERCOURT. HARWICH AND DISTRICT HOS-PITAL. (30 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

EDGWARE GENERAL HOSPITAL. (715 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT PÆDIATRIC REGISTRAR required at above Hospital—32 pædiatric beds. Department is also responsible for the supervision of 64 Cots in Maternity Unit and 50 Cots at Bushey Maternity Hospital. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 17th August, 1954.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (E.N.T. Department—31 Beds), vacant now. The post is recognised for the F.R.C.S. examination.

Applications, with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Mental Deficiency and Child Psychiatry, Little Plumstead Mental Deficiency Hospital Group (900 Beds), near Norwich—large Outpatient Service (including child guidance). Recognised by Conjoint Board and R.M.P.A. for training in both child psychiatry and mental deficiency. Living accommodation available in Hospital. Appointment for 1 year, renewable for second year.

Detailed applications, including age, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 23rd August, 1954. Candidates invited to visit Colony by direct arrangement with Medical Superintendent.

EAST FIFE HOSPITALS BOARD OF MANAGEMENT. ANÆSTHETIST (Registrar), whole-time, required immediately for duties at Kirkcaldy General Hospital (74 Beds) and at other hospitals in Fife as required.

Apply, giving names of 2 referees, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Appointment of RESIDENT HOUSE SURGEON (first post—approved pre-registration), vacant 25th October, 1954. General surgical duties. Registered practitioners within 3 months of qualification eligible. 6 months appointment.

Applications to the Secretary of the Management Committee.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (General—800 Beds.) RESIDENT SENIOR HOUSE OFFICER required for a busy E.N.T. Department with 4 specialist operating-sessions, 5 outpatient clinics and a diagnostic hearing-aid centre. Recognised for D.L.O. and offers valuable experience in all aspects of E.N.T. work.

Apply, stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer.

GLASGOW, N. STOBHILL GENERAL HOSPITAL. PSYCHIATRIC UNIT. HOUSE OFFICERS (resident). Male or Female, required now. (180 Beds.) 1300 admissions yearly. Acute treatable cases. Unit recognised for D.P.M. Salary £50 above standard rate.

Apply to Medical Superintendent.

GLASGOW, N. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the acute Geriatric Unit (70 Beds—for assessment and rehabilitation), supervised by a Consultant Physician specialising in geriatrics. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses in the elderly, and will be for 2 years in the first instance.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be sent to the Medical Superintendent.

GLASGOW ROYAL INFIRMARY. Senior House Officers in Radiodiagnosis (2 vacancies). Duties at above Infirmary.

Write, giving 3 names for reference, not later than 21st August, 1954, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (117 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th August, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GRAVESEND AND NORTH KENT HOSPITAL. (145 Beds—4 residents.) MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER. Post offers good experience with fractures and emergency surgery, and is tenable for 12 months. Salary £745 p.a. with appropriate deductions for residence.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, to be addressed to the Hospital Secretary.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. (472 Beds.) SENIOR HOUSE OFFICER or JUNIOR HOSPITAL MEDICAL OFFICER (resident post). Mental and general experience to be gained. Hospital is recognised as a training centre for the D.P.M. examination.

Application, in writing, to the Physician-Superintendent.

GRIMSBY GENERAL HOSPITAL. (238 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration or Senior House Officer grade). The Hospital has a well-equipped medical library and reading-room.

Applications, together with the names of 2 referees, to be sent to the Hospital Secretary, Grimsby General Hospital, Grimsby.

HADDINGTON. ROODLANDS GENERAL HOSPITAL. EAST LOTHIAN HOSPITALS GROUP BOARD OF MANAGEMENT. RESIDENT HOUSE SURGEON required for 6 months from 1st October, 1954. Small general hospital with X-ray Department and busy Outpatient Department. The post offers excellent experience and is recognised for Pre-registration Service. Salary on National Health Service scale.

Applications, with names of 2 referees, to the Secretary, East Lothian Hospitals Group Board of Management, 31, Court-street, Haddington, before 31st August.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON. The post which will be vacant on 28th August, is for a period of 6 months, and counts towards the D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, to be sent to the Hospital Secretary.

HASTINGS AND ST. LEONARDS. BUCHANAN HOS-PITAL. (94 Beds.) SENIOR HOUSE OFFICER required for Urology and Children's Surgery. Post vacant now, is recognised for F.R.C.S., may be tenable for 6 or 12 months. National scale of salary.

Apply to Hospital Administrator.

HALIFAX GENERAL HOSPITAL. (425 Beds.) House SURGEON required. Approved pre-registration appointment.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post, 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 13th September, 1954.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications invited for appointment of HOUSE SURGEON (general, gynæcology, and obstetrics—first or second post). Recognised under F.R.C.S. regulations, pre-registration post. Duties to commence 21st August, 1954.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £130 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence immediately.

Apply, with full details and references, to Secretary, Hertford County Hospital, Hertford, Herts.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds. 3 Resident Medical Officers.) SENIOR HOUSE OFFICER (recognised for the F.R.C.S.), vacant late September. Duties mainly those of Resident Surgical Officer.

Applications, stating usual particulars, with names and addresses of 2 referees, to the Administrative Officer.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties on 1st September, 1954. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. Hudders-FIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for this Hospital of 262 Beds allocated to general medicine, general surgery, geriatric and maternity purposes. Salary £745 a year with appropriate deduction in respect of residential emoluments.

Applications, together with copies of 2 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (143 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex) (general surgery, gynæcology, and E.N.T.) (general surgery, orthopædics, and E.N.T.). Both posts recognised under F.R.C.S. regulations. First, second, or third posts, vacant now. Approved pre-registration appointments. Tenable for 6 months.

Applications, with full particulars as to age, nationality, qualifications, &c., and copies of testimonials, to be sent to Group Secretary, St. John's Hospital, Fell-lane, Keighley.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Resident Anæsthetist). The post, which is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S. examinations.

Applications, stating age, nationality, together with recent testimonials, to Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (100 Beds for infectious diseases, pulmonary tuberculosis and long-stay orthopædics. The area chest clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man. The post also involves duties in the Pædiatric Department at the Borough General Hospital.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at East Suffolk and Ipswich Hospital, Ipswich.

ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE.

General Hospital, Ramsgate (101 Beds)
HOUSE SURGEON.

General Hospital, Margate (132 Beds)
HOUSE SURGEON.

Approved pre-registration posts. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary of appropriate hospital.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER for Geriatric Unit. Resident. Full-time.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 17th August, 1954.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. RAIGMORE HOSPITAL. HOUSE PHYSICIAN (paediatrics) required for 6 months from 1st October, 1954. Whitley Council salary and conditions of service.

Applications, with references, to Medical Superintendent.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications as soon as possible to the Hospital Secretary.

LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment, which is recognised for the D.A. and the F.F.A. R.C.S., will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

General Medicine

(*a*) Duties in the Wakefield A Group (80 general medical beds) with additional duties in the Wakefield B Group.

(*b*) Duties in the Huddersfield Group (50 general medical beds) (non-resident).

(*c*) Duties mainly at St. Luke's Hospital, Bradford (170 general medical beds) (non-resident).

Paediatrics

Duties in the Bradford A and B Groups. Duties mainly at the Children's Hospital (100 Beds) (resident).

General Surgery

Duties at St. Luke's Hospital, Bradford (150 general surgical beds). Recognised for the F.R.C.S.

Orthopædic Surgery

(*a*) Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery (*may be non-resident*).

(*b*) Royal Bath Hospital, Harrogate (40 orthopædic beds) duties in connection with the Regional Rheumatism Scheme (resident).

(*c*) Duties mainly at Pinderfields General Hospital, Wakefield (70 short-stay and 160 long-stay orthopædic beds), and at other hospitals in the Wakefield A and B Groups (resident).

Otolaryngology

(*a*) York County and City Hospitals (30 E.N.T. beds) (resident or non-resident).

(*b*) Hull Royal Infirmary and associated hospitals (50 E.N.T. beds) (non-resident).

Thoracic Surgery

Duties with the Thoracic Surgical Unit at the Bradford Royal Infirmary, and associated hospitals in the Middleton and Grassington Group (60 Beds for both non-tuberculous and tuberculous cases) (non-resident).

Applications, stating age, qualifications, and details of appointments held (showing dates), with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than Thursday, 19th August, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEICESTER GENERAL HOSPITAL (445 Beds) and ROYAL INFIRMARY (507 Beds). SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance; *Leicester General Hospital* (72 orthopædic beds), Leicester Royal Infirmary (54 orthopædic beds).

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th August, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LOWESTOFT AND NORTH SUFFOLK HOSPITAL, LOWESTOFT. (99 Beds.) *Applications are invited for the appointment* of SENIOR HOUSE SURGEON. Salary £745 p.a., less £150 for residential emoluments. The Hospital is staffed by Consultant General Surgeons and visiting Consultants in all specialties from the Norfolk and Norwich Hospital.

Applications, stating age, qualifications and experience, with names of 2 referees, to Hospital Secretary, immediately.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. (250 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR *required 1st October, at above Hospital. Post recognised for* F.R.C.S. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 18th August, 1954.

LIVERPOOL, 14. BROADGREEN HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER *to the Thoracic Surgical Unit. The post is tenable from* 1st September next. Salary £745 p.a., less a deduction of £130 p.a. in respect of residential emoluments.

Applications, on forms obtainable from the undersigned, at the above address, should be returned completed within 10 days of this advertisement. H. BLYTHE, Group Secretary.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited for a post as SENIOR HOUSE OFFICER in Otorhinolaryngology for the year commencing 1st October, 1954.

Apply as soon as possible on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional Mental Hospital.) Applications invited for post of RESIDENT or NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). *Preference to candidates who have* held house appointments at general hospitals. Previous experience in psychiatry not essential. Unfurnished flat in Hospital grounds for married applicant if required; furnished quarters for single person. Modern methods of investigation and treatment carried out. Outpatient clinics (3) at hospitals in the area, staffed from Hospital.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Medical Superintendent.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited from registered medical practitioners for post of CASUALTY OFFICER. Post recognised for F.R.C.S. Salary on House Officer scale plus £50 p.a.

Applications, stating age, qualifications and experience, with names of 3 referees, to Hospital Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Boards for the F.R.C.S. and the D.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments. Post vacant 1st October, 1954.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post now vacant. Salary £745 a year, with *deduction at present of £150 a year for residential emoluments.*

Applications to Administrative Officer at Hospital as soon as possible.

MANCHESTER ROYAL EYE HOSPITAL. United MANCHESTER HOSPITALS. Applications are invited for post of SENIOR HOUSE OFFICER. Salary £745 p.a., less £155 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) SENIOR HOUSE OFFICER (surgical) required. This appointment affords excellent experience to suitably qualified candidates. Post recognised under F.R.C.S. regulations.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for REGISTRAR in Surgery at Bury General Hospital, the post falling vacant at the beginning of October.

Applications, together with the names of 2 referees, should be sent to H. WILKINSON, Group Secretary,

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of NON-RESIDENT REGISTRAR in E.N.T. Surgery in the above Group with main duties at Hope and the Royal Manchester Children's Hospitals.

Applications, together with copies of 2 recent testimonials, to be sent to the Group Secretary at Salford Royal Hospital Salford, 3, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of NON-RESIDENT REGISTRAR in E.N.T. Surgery to the Salford and West Manchester Groups of hospitals, with main duties at Salford Royal and Park Hospitals.

Applications, together with copies of 2 recent testimonials, to be forwarded to the Group Secretary at Salford Royal Hospital, Salford, 3, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of RESIDENT SURGICAL REGISTRAR at the Royal Albert Edward Infirmary, Wigan, vacant 30th September, 1954. *Preference given to holders of higher* surgical qualifications. Post recognised for F.R.C.S.

Apply with full particulars to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, not later than 28th August, giving the names of 2 referees.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT MEDICAL OFFICER (Registrar grade) at the Wythenshawe Hospital.

*Applications, stating age, qualifications, present post, experi*ence, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, not later than 30th August, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR ANÆSTHETIST (resident) to the Burnley and District Group of hospitals. The hospitals are recognised for the purposes of the D.A.

Applications, together with the names and addresses of 3 *referees, should be addressed to the Group Secretary, Burnley* and District Hospital Management Committee, Burnley General Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR (resident or non-resident) in E.N.T. Surgery to the Wigan and Leigh Group of hospitals, with main duties at the Royal Albert Edward Infirmary, Wigan. The post which is recognised for D.L.O. is now vacant. Married quarters are available.

Application should be made to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, together with the names of 2 referees.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) 2 NON-RESIDENT SENIOR REGISTRARS in Psychiatry.

(i) Oldham and District Hospital Management Committee Group.

(ii) Bury and Rossendale and Rochdale and District Hospital Management Committee Groups.

The person appointed will be required to attend Consultant Psychiatric Clinics and take part in the treatment of inpatients and outpatients at hospitals in the respective Groups, and may be required to carry out some duties at Prestwich Mental Hospital, near Manchester, either concurrently with their other duties or on a whole-time basis for a period of up to 1 year during the course of their engagements. D.P.M. essential. 16th August, 1954.

(*b*) NON-RESIDENT SENIOR REGISTRAR in Pathology (joint post with United Manchester Hospitals). Facilities for training in all branches of pathology will be provided in both teaching and non-teaching hospitals in the Manchester area. Successful applicant will, in the first instance, have main duties at Crumpsall Hospital or Withington Hospital, Manchester. 23rd August, 1954.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON to a Maternity Unit operating temporarily in the Whitworth Park Branch of the above-named Hospital, vacant 1st October, 1954. The post is supernumerary to the establishment recognised for training purposes by the Royal College of Obstetricians and Gynæcologists. Previous obstetrical experience is desirable. An opportunity exists for a limited amount of gynæcological training during tenure of the post. National scale.

Application forms, which may be obtained from the undersigned, to be returned not later than 16th August, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st November, 1954. National scale.

Application forms may be obtained from the undersigned and returned not later than 20th August, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for 2 posts of HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The posts are recognised for the purposes of the M.R.C.O.G. examination. The appointments are for 6 months commencing 1st October, 1954. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 16th August, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Cardiology, to commence as soon as possible. Whole-time, non-resident post, tenable for 12 months, renewable for a further 12 months.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 14th August, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. RESIDENT CLINICAL PATHOLOGIST (Senior House Officer) required for post vacant in August, 1954. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, with full details, to the Group Secretary immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties. The post is fully recognised by the Royal College of Surgeons. Possession of primary F.R.C.S. an advantage as the post is eminently suitable for a person taking the Final F.R.C.S. The Hospital is recognised by the Manchester University for the teaching of undergraduate surgical students.

Applications, stating age, qualifications, present post, nationality, experience, and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical). Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

NEATH GENERAL HOSPITAL. Mid Glamorgan Hospital MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) at above Hospital. This Hospital has a modern well-equipped Pathology Laboratory under the control of a Consultant Pathologist and the Hospital is recognised for the major diplomas.

Applications, naming 2 referees, to be addressed to the Secretary of the Committee, 8, Wind-street, Neath.

NEWARK GENERAL HOSPITAL, Newark. (82 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL OFFICER with general duties required at Registrar rate of pay. This post offers good experience to anyone preparing to enter general practice. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th August, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Male), Urological Unit. The above resident post becomes vacant shortly, and is tenable for 12 months.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials by 14th August, 1954.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Newcastle upon Tyne Hospital Management Committee

REGISTRAR PÆDIATRICIAN to the Newcastle General Hospital. The Children's Department of the Hospital is closely associated with the University Department of Child Health, and the person appointed will be expected to take part in teaching and share in other activities of the University Department. It is intended that, although duties are centred on the Children's Department of the Newcastle General Hospital, the person appointed shall gain further experience by undertaking periods of duty in the care of infants in the Maternity Department of the Hospital and also at the Hospital for Sick Children, where a different kind of experience is available. Appointment for 1 year in the first instance, as from 1st October, 1954, and may be extended for a further period.

Darlington Hospital Management Committee

REGISTRAR E.N.T. SURGEON (whole-time), resident, for duties at Darlington Memorial Hospital (Hundens Unit). Post is recognised for the D.L.O.

Salary scale £850/£965 p.a.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for 2 non-resident whole-time appointments of SENIOR HOUSE OFFICER in a General Medical Clinic at the Royal Victoria Infirmary. The appointments are for 1 year and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service. The salary will be at the rate of £745 p.a., subject to the appropriate deductions.

Applications, giving full details with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required immediately. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1250 Beds.) SENIOR HOUSE OFFICER required. Salary according to national scale. A well-appointed flat is available at the Hospital at moderate rental. The Hospital is approved for training for the D.P.M. of the Corjoint Board and facilities are available in child psychiatry and outpatient clinics locally, and in neurology (at Oxford). There is a modern Admission Unit and an annual admission-rate of over 600 patients. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent at the Hospital within 14 days.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior Surgical HOUSE OFFICER required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on 1st September, 1954. Salary and conditions of service in accordance with the published conditions of the Ministry of Health. If resident £150 p.a. deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

Nottingham General Hospital.

NOTTINGHAM GENERAL HOSPITAL. *Applications* are invited from registered general practitioners for the post of THIRD CASUALTY OFFICER (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence as soon as possible. This post offers wide experience of casualty work. The Staff establishment requires only 1 night in 3 emergency work, and off duty permits time for study for higher examinations.

Applications, stating age, qualifications and experience together with copies of testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female) for the post of SENIOR ANÆSTHETIC HOUSE OFFICER—locum tenens considered. The post is recognised for the D.A. and F.F.A.R.C.S.; duties to commence as soon as possible. £150 deducted for residential emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for 2 posts of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER (locum tenens considered). The posts offer exceptional experience in traumatic surgery. Duties to commence about 1st September, and about 1st October. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Ear, Nose and THROAT DEPARTMENT. Applications are invited for the post of SENIOR E.N.T. HOUSE OFFICER for the above Hospital. This appointment is recognised for the D.L.O., and the F.R.C.S. examinations. Terms and conditions of service in accordance with the regulations of the Ministry of Health. Duties to commence about 5th August. Although the post is normally resident, consideration will be given to any applicant who desires to live out.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

OLDHAM ROYAL INFIRMARY. (190 Beds. Recognised for F.R.C.S.) Applications are invited for the appointment of HOUSE SURGEON (general), recognised for pre-registration purposes, vacant immediately.

Applications, containing details of qualifications and experience, together with copies of 2 recent testimonials and quoting Ref. No. C/114, should be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of NON-RESIDENT REGISTRAR in Pathology at the Radcliffe Infirmary with effect from 1st September, 1954.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 21st August, 1954.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER to Casualty and Traumatic Department, vacant immediately.

RESIDENT DENTAL HOUSE SURGEON, vacant immediately. Recognised for the Fellowship.

HOUSE SURGEON in Obstetrics and Gynæcology, vacant 1st November, 1954, recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and postnatal clinics.

Applications, stating age, nationality, qualifications, and experience, with the names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth.

South Devon and East Cornwall General Hospital Group.

7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Queen Alexandra Hospital (62 acute medical beds)

SENIOR HOUSE PHYSICIAN, vacant 17th August, 1954.

SENIOR HOUSE SURGEON (126 surgical beds), vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in the Chest Services of the Group for duties at the Portsmouth Chest Clinic and the tuberculosis wards at the Infectious Diseases Hospital and Saint Mary's Hospital, Portsmouth, including experience with a major Thoracic Surgery Unit. Vacant 1st October, 1954.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 20th August, 1954. Canvassing will disqualify. Candidates may visit the above Clinic and Hospitals by arrangement with the Group Secretary.

PURLEY AND DISTRICT WAR MEMORIAL HOS-PITAL. (53 Beds.) RESIDENT MEDICAL OFFICER (Senior House Officer status) commencing 23rd August for period of 6 months in first instance. Charge of £167 p.a. for board, lodging, &c. There is no other Resident Medical Officer at Hospital. Hospital comprises surgical, medical, obstetric and gynæcological beds, also a Casualty Department.

Application form obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon.

READING. BATTLE HOSPITAL. (374 Beds.) Applications are invited from registered and provisionally registered medical practitioners for 2 posts of RESIDENT JUNIOR HOUSE SURGEONS in the Area Accident and Orthopædic Departments, vacant 1st September and 1st October, 1954. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 residential emoluments.

Apply, stating age, qualifications, with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from provisionally registered practitioners (Male or Female) for the medical post of JUNIOR HOUSE OFFICER in the E.N.T. and Pædiatric Departments, vacant 15th September, 1954.

Write, stating age, qualifications with dates, and nationality, together with a copy of 1 recent testimonial to the Secretary.

RHYL. PRINCE EDWARD WAR MEMORIAL HOS-PITAL. (41 Beds.) CLWYD AND DEESIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical practitioners (Male or Female) for the appointment of SENIOR HOUSE OFFICER (orthopædics) at the above Hospital. The post is resident. The person appointed will work under the supervision of the Consultant Orthopædic Surgeon for the Group.

Applications, stating age, nationality, qualifications, and previous experience, accompanied by copies of recent testimonials should be sent immediately to—

WILLIAM ROBERTS, Group Secretary.

" Rhianfa," Russell-road, Rhyl, 28th July, 1954.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER in Pathology required from end of September in this large general hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications should be sent immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required from 1st September, 1954. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent stating also names of 2 referees.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required, vacant middle September, 1954. (Post not approved for pre-registration purposes.)

Applications should be forwarded to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALISBURY GENERAL HOSPITAL. Orthopædic DEPARTMENT. SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR to the above department, vacant 1st October, 1954.

Application forms may be obtained from, and must be returned to, Group Secretary, Odstock Hospital, Salisbury, within 14 days of the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT or NON-RESIDENT SENIOR HOUSE OFFICER to the E.N.T. Department. Accommodation may be available for non-resident at a later date. The Department is recognised for D.L.O. and F.R.C.S. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to the Orthopædic Department. This appointment, which is for 6 months, becomes vacant on 14th September, 1954.

Applications, stating age, nationality, and naming 2 referees, should be submitted to the Group Secretary, Odstock Hospital, Salisbury.

SHREWSBURY EYE, EAR AND THROAT HOSPITAL. (70 Beds.) SENIOR HOUSE OFFICER (ophthalmic)—Eye Unit 35 Beds. Post recognised for the D.O.

Applications with copy testimonials to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts. Unless otherwise stated candidates should give age, qualifications, experience, the names of 3 referees, and send applications immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

Royal Infirmary Unit

(*a*) SURGICAL REGISTRAR.

(*b*) SENIOR REGISTRAR in Neurosurgery.

(*c*) REGISTRAR in Neurosurgery.

Above posts are non-resident. Posts (*b*) and (*c*) are vacant and applications should be sent before 30th September, 1954.

Royal Hospital Unit

(*d*) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics.

(*e*) RESIDENT SENIOR HOUSE OFFICER to the Plastic and Jaw Unit.

(*f*) RESIDENT REGISTRAR or SENIOR HOUSE OFFICER in Anæsthetics. Grade according to qualifications and experience. Successful candidate will be required to work in any of the units of The United Sheffield Hospitals.

Posts (*d*) and (*f*) are vacant.

Applications for posts (*d*) and (*e*) should be addressed to The Superintendent, Royal Hospital, West-street, Sheffield, 1.

SHEFFIELD. LODGE MOOR HOSPITAL FOR INFEC-TIOUS DISEASES. (508 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER. Candidates should have held a resident appointment in a Hospital. Salary £745 p.a. (subject to a deduction of £150 p.a. for residential emoluments). The appointment is normally for 1 year, subject to 1 months notice either side.

Applications, stating age, qualifications, &c., to the Group Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD REGIONAL HOSPITAL BOARD. Research ASSISTANT (Senior Registrar grade) required for the Orthopædic Department of the Mansfield General Hospital and associated Centres. Clinical work will also be undertaken, and the allocation of duties between clinical and research work will be approximately 4 and 7 notional half-days per week respectively. The tenure of appointment will be for 1 year in the first instance.

Application forms and further details obtainable from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Completed forms to be returned to the Secretary by 23rd August, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Resident Locum SURGICAL REGISTRAR required at the City General Hospital, Sheffield. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRARS in Psychiatry required for Bracebridge Heath Hospital, near Lincoln; The Pastures Hospital, Mickleover, near Derby; and the Towers Hospital, Humberstone, near Leicester. Appointments for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the hospital area.

Application forms and details of posts available from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 23rd August, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited for the posts of REGISTRAR in Psychiatry in the following hospitals: Carlton Hayes, near Leicester; Mapperley, Nottingham; Pastures, near Derby; and Middlewood, Sheffield; to commence in October, 1954. These posts form a part of the joint training scheme in psychiatry sponsored by the Newcastle and Sheffield Regional Hospital Boards in conjunction with Durham University. The tenure will be subject to annual review and the duties will be changed periodically in order to provide varied experience, including mental deficiency. The normal period of training will be 1½–3 years, according to the previous experience of the trainee, and will terminate either when he obtains the Diploma in Psychological Medicine, or at the termination of his appointment as Registrar. The regulations for the D.P.M. (Durham) require no special course of study for Part I of the examination. In order to take Part II, the candidate will be given 6 months study leave, with pay to attend a full-time course of instruction at Newcastle under the ægis of the Professorial Department of Psychological Medicine.

Full particulars of the posts may be obtained from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Applications should be made to the Secretary of the Board, by 16th August, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Dermatology (limited amount of V.D. work involved). The post is non-resident and the main duties are at the Royal Northern Infirmary and Raigmore Hospitals, Inverness. Previous experience in dermatology essential.

Forms of application and further particulars of the post are obtainable from the undersigned, to whom applications should be submitted by 31st August, 1954.

A. M. FRASER,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore Hospital, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR (transitional) in Medicine, at Bangour Hospital, Broxburn, West Lothian, from 1st October, 1954. The appointment will be for a period of 1 year in the first instance, and the salary will be at the rate of £1400 p.a. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th September, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

REGISTRAR in Psychiatry based at Stobhill Hospital, Glasgow.

SENIOR REGISTRAR in Psychiatry based at Stobhill Hospital, Glasgow. Applications from Registrars at present in general medicine would be considered.

SENIOR REGISTRAR in Anæsthetics based at Glasgow Royal Infirmary.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 2nd September, 1954.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL, SCUNTHORPE, LINCS. (267 Beds.) Vacancy end of September for HOUSE PHYSICIAN (resident). Post graded as Senior House Officer, but also recognised for pre-registration purposes. Busy department of 28 adults' beds plus children's beds and clinics offering variety of experience.

Applications from suitably qualified registered practitioners and pre-registration candidates, naming 2 referees, to Group Secretary.

SCUNTHORPE, LINCOLNSHIRE. WAR MEMORIAL HOSPITAL. (267 Beds.) Vacancy for SENIOR HOUSE OFFICER (general surgery and gynæcology), excellent experience.

Applications, naming 2 referees, to Group Secretary.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. Application is invited for the post of SENIOR HOUSE OFFICER. Facilities are afforded junior staff to become versed in all branches of psychiatry. National Health Service salary and conditions.

Applications, giving full details and copies of 3 recent testimonials, should be sent to the Physician-Superintendent, within 14 days of appearance of this advertisement.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE OFFICER (casualty) required (1 of 2) for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications, with 2 testimonials to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum ANÆSTHETIC REGISTRAR required from 28th August to 10th September.

Applications, together with 2 references, to Hospital Secretary.

SOUTHAMPTON CHEST HOSPITAL. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL REGISTRAR for duties at the above Hospital and the Central Chest Clinic, Southampton. The appointment gives experience in all aspects of tuberculous and non-tuberculous thoracic disease, and candidates should possess good general medical experience. Candidates may visit the units by prior arrangement, if they so desire.

Forms of application will be forwarded by the undersigned upon request, and should be returned by not later than 21st August, 1954. FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for the D.O.M.S.) RESIDENT SENIOR HOUSE OFFICER required from mid-September, 1954. Salary £745 p.a.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST vacant on 1st October, 1954 (Senior House Officer—salary £745 p.a., less a deduction of £140 p.a. for board). Appointment for 18 months, involving duties for 6 months at the General Hospital, Southend, followed by 6 months at the General Hospital, Rochford, and 6 months at hospitals in the Group generally. This combined appointment has been recognised as fulfilling the conditions of the F.F.A.R.C.S. and the D.A.

Applications, &c., should reach the undersigned at the Hospital by 12th August, 1954. J. C. FIELD, Secretary.

ST. ASAPH HOSPITAL, St. Asaph. Clwyd and Deeside HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required immediately for general duties at the above Hospital.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to be forwarded to the undersigned within 14 days from the date of publication of this advertisement. WILLIAM ROBERTS, Group Secretary.
"Rhianfa," Russell-road, Rhyl.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (485 Beds. Recognised for D.A. and recognition for F.F.A.R.C.S. applied for.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st October, 1954. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar, who shares in emergency duties.

Applications, with necessary details, and copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for SENIOR HOUSE OFFICER (orthopædics). Post recognised for F.R.C.S.

Apply, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (orthopædics) required, vacant now. Post recognised for F.R.C.S.

Apply, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of HOUSE PHYSICIAN to the Special Unit for Research in Juvenile Rheumatism, vacant 25th September. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology.

Applications, stating age, qualifications and experience with dates, together with copies of 2 testimonials, to Hospital Secretary, by 15th August.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. REGISTRAR required to the Special Unit for Research in Juvenile Rheumatism at the above Hospital. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 15th August.

TORQUAY. TORBAY HOSPITAL. Torquay District HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgery) required for mid-September, 1954. Post recognised for F.R.C.S. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, nationality, age, with copy testimonials (and quoting Ref. F.955/45) to Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

WARRINGTON GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Male or Female), obstetrics and gynæcology, which will become vacant on 1st October, 1954. This post is recognised for the D.Obst.R.C.O.G. Scale of salary £745 p.a., less £130 for residential emoluments.

Applications, stating age, qualifications with dates, and details of experience, together with copies of recent testimonials, should be sent to the Group Secretary, Warrington and District Hospital Management Committee, c/o General Hospital, Warrington, Lancs.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for RESIDENT HOUSE PHYSICIAN (Male or Female). Recognised for pre-registration. National Health Service terms and conditions. The appointment offers a wide and comprehensive experience in general medicine, including acute medical, pædiatric and infectious diseases. Staffing of the Medical Unit consists of a Registrar, Pædiatric Senior House Officer and 2 House Physicians.

Applications should be forwarded to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female), recognised for pre-registration, at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female); recognised for pre-registration. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited from Males or Females for the post of RESIDENT HOUSE PHYSICIAN (pre-registration or Senior House Officer) at the above Hospital. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments, or Senior House Officer grade—£745 p.a., less £130 for residential emoluments.

Applications should be forwarded to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. Warrington and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. Scale of salary £745 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington.

WELLINGBOROUGH. PARK HOSPITAL. (201 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER to the Geriatric Unit of 40 Beds, at present non-resident, and vacant now. The unit is in close association with a similar larger unit at Kettering.

Applications, stating age, nationality, qualifications and past experience, should be sent to the Group Secretary, General Hospital, Kettering.

WELSH REGIONAL HOSPITAL BOARD AND UNITED CARDIFF HOSPITALS. SENIOR REGISTRAR in Anæsthetics. The successful candidate will work as member of the Department of Anæsthetics, Cardiff, partly in teaching hospitals and partly in other hospitals in Cardiff. Duties will include undergraduate teaching and assistance with research.

Forms of applications obtainable from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days of appearance of advertisement.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (anæsthetics), Royal Gwent Hospital, Newport. Non-resident. Subject to review end of first year.

REGISTRAR (orthopædics), Royal Gwent Hospital, Newport. Separate Fracture and Orthopædic Unit (36 Beds), its own Outpatients, X-ray, and Rehabilitation Departments. Non-resident. Subject to review end of first year.

REGISTRAR (thoracic medicine), Llangwyfan Hospital, near Denbigh. Modern methods of treatment tuberculosis. 400 adult beds (male/female) and children. Hospital also contains major Thoracic Unit. Subject to review end of first year.

REGISTRAR (general surgery), Royal Alexandra Hospital, Rhyl. Subject to review end of first year.

Forms of application obtainable from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days of appearance of advertisement.

WEST DORSET GROUP OF HOSPITALS. Locum Tenens REGISTRAR in Obstetrics and Gynæcology required early September for the above Group. Main duties at Portwey Hospital, Weymouth (42 obstetric and 26 gynæcological beds).

Apply Group Secretary, West Dorset Group Hospital Management Committee, Damers-road, Dorchester, Dorset.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. HOUSE PHYSICIAN (Senior House Officer grade) for duty in the Pædiatric Department at Wigan Infirmary, and also to undertake neonatal work at Billinge Hospital. Post recognised for D.C.H. Post vacant 1st September, 1954. Consultant Pædiatrician-in-charge.

Applications, with names of 2 referees, to the Secretary, Royal Infirmary, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Orthopædic Surgery required. Post now vacant.

Applications, with the names of 2 referees, to the Secretary, Wigan Infirmary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE OFFICER (anæsthetics) required 1st September. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER (Anæsthetist). Appointment recognised for D.A. and F.F.A.R.C.S. Vacant now.

HOUSE OFFICER (Casualty Department), vacant now.

Applications, with copies of 3 recent testimonials, to be sent to Group Secretary, The Royal Hospital, Wolverhampton.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of ANÆSTHETIC REGISTRAR in the above Group (Southlands Hospital, 411 Beds; Worthing Hospital, 273 Beds). Post is recognised for the D.A. and F.F.A.R.C.S.

Forms of application are obtainable from the undersigned, and should be returned within 14 days from the appearance of this advertisement. A. V. OAKTON, Group Secretary,

Worthing Group Hospital Management Committee.
129, Brighton-road, Worthing, Sussex.

WORTHING HOSPITAL. Lyndhurst-road, Worthing, SUSSEX. (273 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the whole-time post of MEDICAL REGISTRAR with duties in the general medical wards and Pædiatric Unit. The post will be vacant from 8th December, 1954.

Forms of application, obtainable from the undersigned, should be submitted by 1st September, 1954.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.
129, Brighton-road, Worthing, Sussex.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, E. Yorks (207 Beds)

(*a*) ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory, with attendance at Branch Laboratory, Driffield. Offers experience all branches pathology.

East Riding General Hospital, Driffield, E. Yorks (269 Beds)

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Approved pre-registration post. General surgical duties. Recognised for F.R.C.S.

Broadgate (Mental) Hospital, Beverley, E. Yorks (650 Beds)

(*c*) SENIOR HOUSE PHYSICIAN, vacant end of August.

(*d*) HOUSE PHYSICIAN (first, second, or third post), vacant now.

Salary for (*b*) and (*d*) is £425 and for (*a*) and (*c*) is £745. Fully qualified practitioners may apply for the pre-registration post.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorks.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER at the above Hospital. Previous experience is essential. The Hospital has 200 beds and is recognised as a training hospital for the F.R.C.S. Post is vacant on 1st October, 1954. The appointment is for 6 months in the first instance, but is renewable for a further 6 months. Salary £775 p.a., less £125 for residential emoluments.

Applications to be submitted not later than 21st August, 1954, to the President, Public Health Committee, General Hospital, Jersey, C.I.

CANADA. ST. MARY'S HOSPITAL, Montreal, Canada. A few outstanding opportunities still available in ROTATING INTERNESHIPS—Medicine, Surgery, Obstetrics, choice of Emergency, Anæsthesia or Laboratory. Hospital located in Medical Centre with attractive stipend. (250 Beds.)

Reply, giving full details to Administrator, St. Mary's Hospital, 3830, Lacombe-avenue, Montreal, P.Q., Canada.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. NEUROLOGY RESIDENCIES available in 700-Bed, university-teaching, general hospital. Salary range $1620–$2220 annually, plus laundry, uniforms and room.

Address inquiries to Medical Director.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. INTERNSHIPS and RESIDENCIES available in 700-Bed general, private Albany Hospital, directly connected with Albany Medical College. Approved for all major specialties. Participating in exchange-visitor programme. Salary range $1320–$2220 annually in addition to laundry, uniforms and room. All appointments begin 1st July, 1955.

For further information apply to Medical Director.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 700-Bed, university-teaching, general hospital, with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1620–$4000 annually plus laundry, uniforms and room.

Address inquiries to Medical Director.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 or 2-year General Practice RESIDENCY in new 230-Bed general hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary begins at $275 per month.

Apply : Director.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND. DEPARTMENT OF SURGERY. ORTHOPÆDIC AND TRAUMATIC UNIT. SENIOR ORTHOPÆDIC REGISTRAR, Dunedin Hospital. Applications are invited for the position of Senior Orthopædic Registrar, to commence duty on 1st January, 1955. The applicant must possess a higher qualification in surgery and have had extensive experience in orthopædic and traumatic surgery. His duties will include the teaching of medical students, nurses and physiotherapy students. The appointment is for a minimum of 1 year and tenable up to 3 years, subject to termination by 3 months notice in writing from either side. The salary payable under the Hospital Employment (Medical Officers) Regulations 1952, Amendment No. 1, is £806 5s. p.a., rising by annual increments of £57 10s. to a maximum of £921 5s. p.a., plus cost-of-living bonus of £62 12s. p.a. A living-out allowance of £179 8s. p.a. is payable in addition to the above salary if non-resident. Travelling expenses are payable as stated in the conditions of appointment. Application forms and further particulars may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, or from the Office of the High Commissioner for New Zealand, 415, Strand, London.

Applications, stating age, qualifications and experience, together with Radiological and Health Certificates, and copies of testimonials, will be received by the undersigned up till 10 A.M. on Monday, 27th September, 1954.

W. A. WILLIAMSON, Secretary.

Otago Hospital Board, P.O. Box 946, Dunedin, New Zealand.

Public Appointments

ROYAL ARMY MEDICAL CORPS. **For new conditions and terms of service see page 19.**

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
CALNE ..	WILTS. ..	21ST AUGUST, 1954

FEDERATION OF RHODESIA AND NYASALAND. DEPARTMENT OF DEFENCE. A vacancy exists for a Male MEDICAL OFFICER in the Permanent Forces. The appointment, which is permanent and pensionable, will be in the rank of Captain, and the successful applicant, who must be British, under 35, will be required to attest in, and serve under, the conditions of service of the Southern Rhodesia Staff Corps.

The rates of pay are : 1st year £1269 p.a. ; 2nd year £1302 p.a. ; 3rd year £1335 p.a. ; 4th year £1368 p.a.

Allowances : Professional allowance £200 p.a. and for married officers, quarters allowance up to £180 p.a. and children's allowances.

Duties : The Officer will be on the staff of the Director of Medical Services and his duties will include medical attention of Permanent Force Personnel and their dependants, which includes domiciliary visits and treatment in Government Hospitals, to which Medical Officers have full access. Previous experience of service medicine is desirable but not essential.

Application forms and further details from the Secretary, Rhodesia House, 429, Strand, W.C.2. Completed forms to be returned by 31st August.

FLINTSHIRE COUNTY COUNCIL. Applications are invited from duly qualified and registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER (Male or Female). The possession of additional qualifications such as the D.P.H., D.C.H., &c., will be an advantage. The duties will be mainly connected with the Maternity and Child Welfare Services and the School Health Services. If desired the person appointed will be given facilities to obtain experience in all the services provided by the department including administration. Previous experience of Local Health Authority Services may be taken into consideration in assessing the commencing salary, which will be in accordance with the recent award of the Industrial Court, £950, rising to £1300 p.a. An appropriate allowance for travelling and subsistence will be payable. The appointment is superannuable and the successful candidate will be required to satisfy a medical examination.

Form of application together with further particulars, can be obtained from the County Medical Officer, Flintshire County Council, Llwynegrin, Mold, and on completion should be forwarded to the undersigned not later than 28th August, 1954.

W. HUGH JONES, Clerk of the County Council.

County Buildings, Mold.

WALSALL. COUNTY BOROUGH OF WALSALL. Applications are invited from qualified medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH at a salary of £950 p.a., rising by annual increments of £50 to £1300 p.a. Possession of the D.P.H. or D.C.H. will be considered an advantage. Commencing salary according to qualifications and experience.

Further particulars and application forms may be obtained from me. W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

DERBYSHIRE COUNTY COUNCIL. Applications are invited from Male medical practitioners for the whole-time appointment of SENIOR ASSISTANT MEDICAL OFFICER. The possession of the D.P.H. is essential and experience in mental deficiency work is desirable. The work will be largely administrative in connection with the Public Health and School Health Services, but other duties may be assigned to the Officer appointed, who will work under the direction of the County Medical Officer. Office accommodation will be provided in the Central Office. The salary is £1100, rising by annual increments of £50 to £1500 p.a., together with a travelling allowance in accordance with the County Council's scale.

Applications should be submitted to the undersigned so that they are received not later than 16th August, 1954. Forms of application are not provided. The conditions of service will be supplied on request.

J. B. S. MORGAN, County Medical Officer.

County Offices, St. Mary's Gate, Derby.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Position vacant. DUBLIN PORT MEDICAL OFFICER. Salary £1191–£36–£1414.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 20th August, 1954.

GLAMORGAN EDUCATION AUTHORITY. Rhondda URBAN DISTRICT COUNCIL. COMMITTEE FOR EDUCATION. Applications are invited from registered medical practitioners for appointment as ASSISTANT MEDICAL OFFICER, under the supervision of the District School Medical Officer at a salary of £950 p.a. rising by annual increments of £50 to £1300 p.a. Preference will be given to candidates holding the D.P.H. or D.C.H. and experience in pædiatrics will be an advantage. The appointment is superannuable and the successful candidate will be required to pass an examination as to physical fitness. The successful candidate, if in need of housing accommodation and not already a resident of the Rhondda Urban Area, may be offered the tenancy of a council house.

Forms of application and conditions of appointment may be obtained from the District School Medical Officer, Tydfil House, Pentre, Rhondda, by whom completed applications should be received as soon as possible.

D. J. JONES, Clerk of the Council.

HER MAJESTY'S COLONIAL SERVICE. Singapore. MEDICAL OFFICER (Anæsthetist) is required in Singapore to administer anæsthetics in Government hospitals and to instruct Junior Medical Officers. Candidates must possess the D.A. (obtained before November, 1953) or F.F.A.R.C.S. Appointment will be on 3 years probation to the permanent establishment with pension (non-contributory) at age of 55 years. Basic salary is in the scale £1148–£49–£1442/£1540–£56–£1988 a year. Expatriation pay, half of which will count for pension, is payable at the rate of £312 8s.–£350 a year. A temporary non-pensionable variable allowance of £210 a year is payable to single officers, £392 a year to married officers without children, and £401 16s.–£560 a year to married officers with dependent children. A candidate in the National Health Service may resign from the National Health Service but retain his superannuation rights during his time in the Colonial Service (up to 6 years) and receive a resettlement grant of 20% of the aggregate of his colonial salary on leaving the Colonial Service. European children do well up to the age of about 6 in Singapore and schools are available locally. Income-tax is payable at local rates which are lower than those in the United Kingdom. Government quarters with heavy furniture are provided at a low rental, or an allowance is paid in lieu of quarters. Free passages are provided for the doctor, his wife, and children under the age of 10 (not exceeding 4 persons besides himself) on appointment and once each way during each tour of duty of 3–4 years. Generous home leave is granted and local leave is permissible.

Application forms from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/60/08).

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited, for Short Service Commissions of 4 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, to be medically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

REGINA, SASKATCHEWAN
ALLAN BLAIR MEMORIAL CLINIC

SENIOR CANCER CLINIC ASSOCIATE required for above Clinic.

Salary range : $693–$828 per month.

Requirements : Certification by the Royal College of Physicians and Surgeons of Canada, or its equivalent. Applicant should be a Radiotherapist with a postgraduate degree in radiation therapy, and considerable experience in the handling of patients being treated with radiation therapy.

For application forms write to :

PUBLIC SERVICE COMMISSION,
Legislative Building,
Regina, Saskatchewan,
Canada.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointments of ASSISTANT DIVISIONAL MEDICAL OFFICERS in areas adjacent to Bolton/Bury, Burnley, Blackburn, Fleetwood and Preston. Possession of D.P.H. desirable. Salary £950–£1300 p.a. Travelling and subsistence allowances where applicable. Posts superannuable and subject to medical examination.

Application forms and further particulars from County Medical Officer of Health, East Cliff County Offices, Preston.

STAFFORDSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL AND SCHOOL MEDICAL OFFICERS. Applications are invited from fully qualified medical practitioners for the above-mentioned appointments and those holding the Diploma of Public Health will be given preference. The candidates appointed will undertake clinical work in the School Health and Child Welfare Services under the direction of the County Medical Officer of Health and will be required to perform such other duties as may from time to time be prescribed. The salary scale is £950 p.a. rising by annual increments of £50 to a maximum of £1300 p.a., and previous similar service may be taken into consideration when deciding the commencing rate. Each selected candidate may be required to provide a motor-car, for which allowances will be paid in accordance with the County Council scale. A lodging allowance of 25s. per week and return railway fare home every 2 months will be paid for a maximum period of 6 months where the successful candidate is married and has to continue to maintain a home outside the geographical County while seeking housing accommodation. Each appointment will be terminable by 3 months notice in writing on either side and subject to the provisions of the appropriate superannuation acts and regulations, in which connection the selected candidates must pass a medical examination and submit their birth certificates.

Forms of application may be obtained from the undersigned and should be returned to the County Medical Officer of Health, County Buildings, Stafford, not later than 21st August, 1954, together with copies of not more than 3 recent testimonials.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford, 16th July, 1954.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

London, E.C. ; W.C. ; W.1 and W.2 ; Walworth, S.E.17.
Swanley (Bromley).
Oakham (Oakham).
Rugby (Rugby).

SCOTLAND

Edinburgh 3 (Edinburgh).

YORKSHIRE. NORTH RIDING COUNTY COUNCIL. Applications are invited from suitably qualified medical practitioners for the whole-time joint appointment of MEDICAL OFFICER OF HEALTH to the Northallerton Urban District Council and the Aysgarth, Leyburn, Masham, and Northallerton Rural District Councils and ASSISTANT COUNTY MEDICAL OFFICER. The successful applicant may later be required to undertake the duties of Medical Officer of Health for the Bedale Rural District. Salary £1385 6s. 10d., rising by annual increments to £1738 6s. Conditions of service in accordance with Whitley Councils recommendations (Medical Council Committee "C"). A modern detached house is provided at Leyburn for the Officer appointed and he will be required to reside therein and to pay an economic rent.

Forms of application and further particulars obtainable from the undersigned to be returned not later than 28th August, 1954. Canvassing will disqualify.

H. G. THORNLEY, Clerk of the County Council.

County Hall, Northallerton, 29th July, 1954.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. Applications are invited from qualified medical practitioners (Women) for the temporary post of ASSISTANT MEDICAL OFFICER on the Maternity and Child Welfare Services. Candidates should have experience in diseases of children and obstetrics. The post is temporary—for a period of 12 months. Opportunity will be given for hospital contact with both paediatrics and obstetrics. The possession of a D.P.H. or D.C.H. will be considered an additional qualification. Salary scale : £950–£50–£1300 p.a. The appointment will be subject to the provisions of the National Health Service superannuation regulations and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Medical Officer of Health, Public Health Department, Glebe-street, Stoke-on-Trent, and should be returned, accompanied by copies of not more than 3 recent testimonials as soon as possible.

HARRY TAYLOR, Town Clerk.

WORCESTERSHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners (Men or Women) for the whole-time post of ASSISTANT COUNTY MEDICAL OFFICER. The duties will chiefly concern School Health and Child Welfare Services. The possession of the D.C.H. or the D.P.H. will be an advantage. The salary will be in accordance with the national scale, the starting-point to be fixed in accordance with qualifications and experience with travelling and subsistence allowances according to the national scale. The successful candidate must own and drive a car. The post is superannuable and subject to medical examination.

Application forms may be obtained from the County Medical Officer, County Buildings, Worcester.

(Q.232.) W. R. SCURFIELD, Clerk of the County Council.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

BIRMINGHAM, STECHFORD. Applications invited for VACANCY (urban) due to resignation. List approximately 3700. Residence and surgery available. Apply on E.C.16A not later than 4th September, 1954, to—

K. F. G. DAY, Clerk of Birmingham Executive Council.

Sutton New-road, Erdington, Birmingham, 23.

WOMBWELL, YORKSHIRE. Applications are invited for appointment to Medical Practice VACANCY, list approximately 3100 patients. House and separate surgery with flat —either or both available for purchase. Apply on Form E.C.16A, available on application to the undersigned, not later than 16th August, 1954. C. H. STABLER, Clerk of the Council, The West Riding Executive Council.

5, St. John's-north, Wakefield, Yorks.

ZETLAND EXECUTIVE COUNCIL. Applications are invited from registered medical practitioners to fill the VACANCY in the Medical Service area of Unst, Shetland Islands. Persons on list number approximately 1000 and there is a mileage payment in the practice. Dispensing practice. A house and professional accommodation is available. Applications stating age, qualifications and experience should be lodged with the Clerk, Zetland Executive Council, Commercial-street, Lerwick, Shetland, on or before 28th August, 1954.

Hospital Services : Non-Medical Appointments

LINCOLN. COUNTY HOSPITAL. Applications are invited from graduates in biochemistry or from Associates I.M.L.T. (in Biochemistry) for a post in the Biochemical Laboratory, County Hospital, Lincoln. The salary which will be in accordance with Whitley Council recommendations will be paid by a grant from the Clinical Research Board and the work will be done under the supervision of the Chemical Pathologist. Experience in Hospital Laboratory techniques will be gained. Tenure, 1 year, in the first instance.

Applications to be sent to the Chemical Pathologist, County Hospital, Lincoln.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Applications are invited for post as Medical Officer for Tea Garden practice in Northern India. Surgical and gynæcological experience essential. Salary Rs.2300 per mensem (£172) plus various allowances, free furnished quarters. 6 months home leave after 3 years, passage paid.—Apply : Address, No. 949, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Navy, Army and Air Force Institutes require an Assistant Medical Officer to fill an unexpected vacancy at Headquarters in London. Some previous experience of occupational health is desirable. Starting salary according to experience in the range prescribed by the British Medical Association for Industrial Medical Officers. Superannuation scheme in operation.—Applications should be submitted, with details of age, qualifications and previous experience, to the Chief Medical Officer, N.A.A.F.I., Imperial Court, Kennington-lane, London, S.E.11.

Consultant Surgeon, with extensive medical literary experience, seeks association or appointment with senior medical publishing house.—Address, No. 954, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Experienced Locum available 19th August—1st September, married, car, Nottingham district preferred.—Address, No. 953, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Educated man and wife offer help ; clerical, or driver, domestic to Doctor. Country or small town preferred.—Address, No. 952, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Accommodation will soon be available in modern building undergoing conversion, London, W.1. Professional premises suitable for Radiologist or Medical Consultant.—Address, No. 951, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

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Many fat people overeat because inwardly they are unhappy and ill at ease. In food they find solace, and a substitute for the affection their obesity denies them. Their hearts are in their mouths.

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